

For Reference

NOT TO BE TAKEN FROM THIS ROOM

Ex LIBRIS
UNIVERSITATIS
ALBERTAENSIS



THE UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR DOROTHY MAE DIGDON JAMES
TITLE OF THESIS A Study of Patterns of Prediction in Reading
 Comprehension in Grades Four and Six
DEGREE FOR WHICH THESIS WAS PRESENTED Ph. D.
YEAR THIS DEGREE GRANTED 1979

Permission is hereby granted to the UNIVERSITY OF ALBERTA
LIBRARY to reproduce single copies of this thesis and to lend or
sell such copies for private, scholarly or scientific research
purposes only.

The author reserves other publication rights, and neither
the thesis nor extensive extracts from it may be printed or otherwise
reproduced without the author's written permission.

(Signed)

PERMANEN

39 Briar

Halifax,

Nova Sco

DATED April 9, 1979

THE UNIVERSITY OF ALBERTA

A STUDY OF PATTERNS OF PREDICTION
IN READING COMPREHENSION
IN GRADES FOUR AND SIX

by



DOROTHY MAE DIGDON JAMES

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA

SPRING, 1979

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "A Study of Patterns of Prediction in Reading Comprehension in Grades Four and Six" submitted by Dorothy Mae Digdon James in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

Date *April 9, 1979*....

ABSTRACT

Although there is widespread agreement that prediction operates in both reading and listening, there is only very limited understanding of the nature of the predictive process. This investigation was designed to explore the nature of prediction in reading in proficient and less proficient readers in grades four and six.

Four stories were constructed and the responses made by the subjects as they read these stories were recorded for analysis. Two of the stories were read independently with the subjects telling their thoughts as they read (Unprobed Treatment). During the reading of the other two stories the subjects were stopped from time to time and asked to tell what they thought would happen next (Probed Treatment). In addition, they were asked to give reasons for their responses. Comprehension tests checked their understanding of the stories they had read.

Categorization of the responses according to the number and kinds of predictions made, the types of supporting evidence offered and the levels of thought involved permitted comparisons of the operation of the predictive process across grades, groups and treatments.

The qualitative analysis, determined by the nature of the responses, was supplemented by findings from the statistical treatment of the data where the need for this was indicated. Two three-way analyses of variance were performed on ten dependent variables and coefficients of correlation were computed on selected variables.

It was found that all readers in the sample could predict when

probed but that some less proficient readers gave little indication of predicting when reading independently. Although differences in the number and kinds of predictions made were not always significant when subjects were probed, the frequency with which proficient and less proficient readers predicted when reading independently differed significantly. The appropriateness of the predictions given tended to vary with the reading proficiency level of the reader.

A consideration of the levels of thought involved in the responses showed that proficient readers tended to think more divergently in response to literature than did their less proficient counterparts who were preoccupied with the recitation of the details of the story. Patterns of responses characterizing proficient and less proficient readers emerged from the qualitative analysis.

Although the differences in the response patterns between the grades were not statistically significant, the developmental nature of the predictive process was indicated. In some aspects of the process less proficient readers appeared to regress rather than progress as they passed through the grades.

Although the nature of prediction in reading was shown to be influenced by the structure and content of the selections read, these were not assigned a directive role. The individual's learning style, his oral language background and other affective factors influenced the nature of his responses. A close relationship was found between prediction in reading and the subject's ability to comprehend; to support his conclusions and to think divergently about the selections read.

ACKNOWLEDGEMENTS

The writer wishes to acknowledge the assistance of others and to express sincere appreciation to colleagues and friends who offered encouragement throughout the course of this investigation.

Dr. Marion D. Jenkinson, the thesis supervisor, provided direction and guidance at all stages of the preparation of the study. Her kindness and patience were sincerely appreciated.

Dr. Jean Robertson and Dr. W.H.O. Schmidt, members of the supervisory committee, offered helpful appraisals and suggestions.

The continuing interest expressed by Dr. P.A. McFetridge, Dr. F. MacCannell and Dr. W. Laing, members of the examining committee, has been encouraging.

The presence at the final oral examination of Dr. R.D. Armstrong was much appreciated. The suggestions he offered and the related issues which he raised have made a contribution to this research.

Thanks is extended to the principals, teachers and children of Burton Ettinger and Fairview Heights Elementary Schools. The eager enthusiasm of the children made the task of data collection a rich and rewarding experience.

Several people helped with the secretarial work, read preliminary drafts and offered constructive criticism. Helen Fraser, Hazel Johnson and Min Fitzgerald made a greater contribution than they realize. Their interest in the study is deeply appreciated.

Finally, I am indebted to my family, Don, Howard and Gordon, without whose patience and understanding this study would not have become a reality.

TABLE OF CONTENTS

CHAPTER	Page
I. INTRODUCTION AND STATEMENT OF THE PROBLEM	1
Statement of Purpose	3
Overview of the Plan of the Study	3
Definition of Terms	4
Development of Research Question and	
Hypotheses	7
Assumptions	13
Limitations of the Study	13
Significance of the Study	14
Organization of the Investigation	15
II. BACKGROUND OF THE STUDY	16
Relationship Between Reading and	
Thinking	17
Perception and Cognition	22
Prediction and Reading	26
Introspective Techniques in Studies of	
Reading	39
Summary: Focus of the Study	41
III. THE DESIGN OF THE STUDY	43
Analysis of Selected Instructional	
Materials	43

CHAPTER	Page
Construction of the Stimulus Materials	45
Pilot Study 1	48
Pilot Study 2	49
The Sample	51
Testing Instruments	53
Collection of the Data	55
Analysis of the Data	56
Kinds of Predictions	60
Supporting Evidence	62
Levels of Thought	64
The Reliability of the Analysis of the	
Responses	67
Summary	69
IV. FINDINGS: STATISTICAL ANALYSIS OF THE DATA	71
Interpretive Level Responses	74
Dependent Variable One: Number of	
Predictions	74
Dependent Variable Two: Number of	
Appropriate Predictions	83
Dependent Variable Three: Number of	
Plausible but Unlikely Predictions	87
Dependent Variable Four: Number of	
Inappropriate Predictions	89
Applicative Level Responses	93
Dependent Variable Five: Number of	
Supported Responses	93

CHAPTER	Page
Levels of Thought	97
Dependent Variable Six: Number of Cognitive Memory Productions	97
Dependent Variable Seven: Number of Convergent Productions	100
Dependent Variable Eight: Number of Divergent Productions	102
Dependent Variable Nine: Number of Evaluative Productions	106
Dependent Variable Ten: Comprehension of Stories	108
Relationship: Standardized Tests and Ten Dependent Variables	111
Differences Revealed by the Analyses	118
Summary	120
V. FINDINGS: QUALITATIVE ANALYSIS OF THE DATA	122
Number of Predictions	122
Kinds of Predictions	126
Supporting Evidence	132
Levels of Thought	143
Comprehension of the Stories	150
Relationship: Prediction and Organizational Patterns	157
Summary	165
VI. SUMMARY AND CONCLUSIONS	169
Summary of the Study	169

CHAPTER	Page
Conclusions from the Investigation	170
Research Question 1	170
Research Question 2	174
Research Question 3	176
Research Question 4	177
Research Question 5	179
Research Question 6	182
Research Question 7	185
Research Question 8	187
Research Question 9	189
Research Question 10	191
Research Question 11	193
Research Question 12	195
Implications of the Study	197
Suggestions for Further Research	205
Concluding Statement	212
BIBLIOGRAPHY	213
APPENDICES	222
A. Questions Used in the Interview	223
B. Stories	227
C. Multiple Choice Tests and Open-ended Question Tests	249
D. Order of Presentation of Stories	274
E. Directions for Reading	276
F. Data	279

G .	Three-Way Analysis of Variance on Selected Variables by Grade, Group and Treatment for Two Stories (DA & LL)	370
H .	Three-Way Analysis of Variance on Selected Variables by Grade, Group and Treatment for Two Stories (MS & OS)	375
I .	Correlation Coefficients	380

LIST OF TABLES

TABLE		Page
3.1	Selections from Instructional Materials	
	Requiring Prediction	44
3.2	Organizational Patterns of Stories	45
3.3	Composition of Reading Groups According to Grade, Sex and Scores on the <u>C.T.B.S.</u>	53
3.4	Means and Range of Scores on the <u>Peabody</u> <u>Picture Vocabulary Test</u>	54
3.5	Percentage of Agreement Between the Investigator and Each of Three Independent Judges in Classifying Responses	68
3.6	Revised Percentage of Agreement Between the Investigator and Each of Three Independent Judges in Classifying Responses	69
4.1	Mean Number of Predictions	75
4.2	Summary: Three-Way Analysis of Variance - Number of Predictions	76
4.3	Significant Interactions Revealed in DA & LL on Variable One: Number of Predictions and Results of Scheffé Test	78

TABLE	Page
4.4 Interrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 4 Probed	79
4.5 Interrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 4 Unprobed	80
4.6 Interrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 6 Probed	81
4.7 Interrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 6 Unprobed	82
4.8 Mean Number of Appropriate Predictions	84
4.9 Summary: Three-Way Analysis of Variance - Appropriate Predictions	84
4.10 Significant Interactions Revealed in DA & LL on Variable Two: Number of Appropriate Predictions and Results of Scheffé Tests	85
4.11 Mean Number of Plausible but Unlikely Predictions	88
4.12 Summary: Three-Way Analysis of Variance - Plausible but Unlikely Predictions	88
4.13 Mean Number of Inappropriate Predictions	90
4.14 Summary: Three-Way Analysis of Variance - Inappropriate Predictions	90

TABLE		Page
4.15	Significant Interactions Revealed in DA & LL on Variable Four: Number of Inappropriate Predictions and Results of Scheffé Tests	91
4.16	Mean Number of Supported Responses	94
4.17	Summary: Three-Way Analysis of Variance - Supported Responses	94
4.18	Significant Interactions Revealed in MS & OS on Variable Five: Number of Supported Responses and Results of Scheffé Tests	96
4.19	Mean Number of Cognitive Memory Productions	99
4.20	Summary: Three-Way Analysis of Variance - Cognitive Memory Productions	99
4.21	Mean Number of Convergent Productions	101
4.22	Summary: Three-Way Analysis of Variance - Convergent Productions	101
4.23	Mean Number of Divergent Productions	103
4.24	Summary: Three-Way Analysis of Variance - Divergent Productions	103
4.25	Significant Interactions Revealed in MS & OS on Variable Eight: Number of Divergent Productions and Results of Scheffé Tests	105
4.26	Mean Number of Evaluative Productions	107
4.27	Summary: Three-Way Analysis of Variance - Evaluative Productions	107

TABLE	Page
4.28	Significant Interactions Revealed in MS & OS on Variable Nine: Number of Evaluative Productions and Results of Scheffé Tests 109
4.29	Mean Comprehension Scores on Stories 110
4.30	Summary: Three-Way Analysis of Variance - Comprehension Scores on Stories 110
4.31	Significant Interactions Revealed in MS & OS on Variable Ten: Comprehension Scores on Stories Read and Results of Scheffé Tests 112
4.32	Summary: Variables for Which Significant Correlations were Revealed for Grade Four Subjects Probed 114
4.33	Summary: Variables for which Significant Correlations were Revealed for Grade Four Subjects Unprobed 115
4.34	Summary: Variables for which Significant Correlations were Revealed for Grade Six Subjects Probed 116
4.35	Summary: Variables for which Significant Correlations were Revealed for Grade Six Subjects Unprobed 117
4.36	Variables for which Significant Differences were Revealed by the Three-way Analyses of Variance . . 119

TABLE	Page
5.1 Number of Predictions	123
5.2 Proportion of Kinds of Predictions in Relation to the Total Number of Predictions Made (Probed Treatment)	128
5.3 Proportion of Kinds of Predictions in Relation to the Total Number of Predictions Made (Unprobed Treatment)	128
5.4 Proportion of Types of Supporting Evidence in Relation to the Total Number of Responses Made (Probed Treatment).	133
5.41 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Factual Support - Probed.	134
5.42 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Logical Support - Probed.	136
5.43 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Experiential Support - Probed	138
5.44 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Irrelevant Support - Probed	140
5.45 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: No Support - Probed	141

TABLE	Page
5.46 Performance Under Two Treatments (Probed and Unprobed) on Certain Variables: Significant Differences Indicated by the Application of Chi Square	142
5.5 Proportion of Types of Supporting Evidence in Relation to the Total Number of Responses Made (Unprobed Treatment)	133
5.51 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Factual Support - Unprobed.	134
5.52 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Logical Support - Unprobed.	136
5.53 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Experiential Support - Unprobed	138
5.54 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Irrelevant Support - Unprobed	140
5.55 Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: No Support - Unprobed	141
5.6 Proportion of Levels of Thought in Relation to the Total Number of Responses Made (Probed Treatment)	145

TABLE	Page
5.7 Proportion of Levels of Thought in Relation to the Total Number of Responses Made (Unprobed Treatment)	145
5.8 Mean Scores on Tests of Comprehension of Stories Read	151
5.9 Relationship: Prediction and Comprehension	155
G.1 Three-Way Analysis of Variance on Selected Variables by Grade, Group and Treatment for DA & LL	370
H.1 Three-Way Analysis of Variance on Selected Variables by Grade, Group and Treatment for MS & OS	375
I.1 Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 4 Probed	381
I.2 Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 4 Unprobed	382
I.3 Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 6 Probed	383
I.4 Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables for Grade 6 Unprobed	384

LIST OF FIGURES

FIGURE	Page
3.1 Method of Analyzing Responses	58
4.1 Significant Interactions Graphs: Variable One - Number of Predictions	78
4.2 Significant Interactions Graphs: Variable Two - Number of Appropriate Predictions	85
4.3 Significant Interactions Graphs: Variable Four - Number of Inappropriate Predictions	91
4.4 Significant Interactions Graphs: Variable Five - Number of Supported Responses	96
4.5 Significant Interactions Graphs: Variable Eight - Number of Divergent Productions	105
4.6 Significant Interactions Graphs: Variable Nine - Number of Evaluative Productions	109
4.7 Significant Interactions Graphs: Variable Ten - Comprehension Scores on Stories Read	112
5.1 Number of Responses Made by Boys and Girls	160
5.2 Supported Responses Made by Boys and Girls	160
5.3 Number of Predictions Made by Boys and Girls.	161
5.4 Appropriate Predictions Made by Boys and Girls.	161
5.5 Plausible but Unlikely Predictions Made by Boys and Girls.	162
5.6 Inappropriate Predictions Made by Boys and Girls	162

5.7	Cognitive Memory Productions Given by Boys and Girls	163
5.8	Convergent Productions Given by Boys and Girls	163
5.9	Divergent Productions Given by Boys and Girls	163
5.10	Evaluative Productions Given by Boys and Girls	163
5.11	Comprehension Scores Made by Boys and Girls	164

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

The ability to read beyond the lines, although widely recognized as a reading competency, is only vaguely understood. For nearly three decades educators have pondered Edgar Dale's (1954) comment that reading involves "reading the lines, reading between the lines and reading beyond the lines". Research has shed some light on the first part of this statement, reading the lines. The phenomenon of reading between the lines and beyond the lines, however, continues to puzzle those who seek to explain it.

Most teachers would be in agreement concerning the desirability of skill in this important area of reading. They observe the ease with which proficient readers combine visual and non-visual input in order to comprehend beyond the information given, while others in the class struggle with word identification. This economy of cognitive activity which characterizes the proficient reader represents a potentially fruitful area of exploration.

For some time instructional materials have suggested that teachers motivate the children to read by allowing them to guess from pictures or a title some of the events that may follow. An interest in the role of prediction has been expressed in the literature by reading experts for many years (Huey, 1908; Smith, 1975). Research has provided some information concerning the relationship between prediction and oral reading miscues (Goodman, 1965). Yet little

attention has been given to the role of ideational prediction in reading comprehension. Since what the reader sees is influenced by what he expects to see (Bruner and Goodman, 1947), it is possible that his interpretation of the selection he reads is related to the nature of his prediction of events.

Only a very limited amount of research considers the processes involved in prediction in reading. In order for the reader to go beyond the information given, he must first analyze and synthesize the material presented. The ability to evaluate, to know what information to select and what to reject are aspects of prediction. Tendencies toward confirmation of predictions and reappraisal of the situation may vary from one individual to another. Studies (Taba, et al , 1964; Gallagher, et al , 1967) have revealed differences in the abilities of children at different levels of development to think divergently. It is possible that these findings relate to the ability to predict when reading.

Although many have affirmed a belief in the reality of prediction, there is little empirical evidence that all readers do, in fact, predict. It is not known if there are differences in the strategies employed by readers at different levels of cognitive development. Evidence concerning the nature of prediction in readers at various levels of proficiency is lacking. It is not known how readers make use of the text to confirm their predictions.

Since prediction is an important aspect of reading comprehension, an examination of the predictive process may provide information which illuminates the complex process of reading. The role of ideational prediction, its influence on reading strategies and its relationship to

comprehension in silent reading is an exciting area of investigation.

Statement of Purpose

The major purpose of the study was to explore the nature of ideational prediction in proficient and less proficient readers in grades four and six when reading continuous discourse. A second aim was to determine if there is a relationship between the reader's predictions while reading and his score on a comprehension test based on the passage he has read.

In addition, the study was designed to determine if in making predictions there are general patterns of cognitive operations involved which characterize groups of individuals, or if the thought processes involved are idiosyncratic. The selection of subjects from grades four and six was for the purpose of illuminating the process at different levels of cognitive development.

Overview of the Plan of the Study

The study was designed to explore the nature of ideational prediction in young readers through the use of three tasks. The first task required the subjects to read two stories and to make predictions in response to the questions of the investigator. Having shown in this way whether they can predict, the readers were required in task two, through the use of the introspective technique, to show whether they do predict when reading independently. Task two consisted of reading two additional stories and telling their thoughts as they read. Following this the subjects were required to do a comprehension test on all four stories.

Thirty-two subjects, selected on the basis of their achievement on a standardized reading test and classified as proficient readers and less proficient readers completed these tasks. Their responses were categorized according to the number and kinds of predictions made, the types of supporting evidence given for the responses and the levels of thought involved in making the response. The data derived from this classification were statistically tested to reveal any differences which might exist due to grade, group or treatment. In addition, an informal analysis of the responses revealed other qualitative differences.

From these analyses conclusions were drawn regarding the nature of prediction in reading and inferences were made concerning the cognitive processes involved.

Definition of Terms

For the purpose of this study the following definitions were employed:

Ideational Prediction

Ideational prediction refers to the ability to read beyond the lines. Based on the interaction of minimal visual and non-visual information the reader anticipates ideas which have not yet been presented. Whereas prediction is closely related to inference, the difference is in the amount of structure provided. The latter would be more aptly described as reading between the lines.

Appropriate Predictions

Appropriate predictions are predictions which are believable and logically possible. Predictions of those events which either did occur in the story or those which quite conceivably could occur were classed as appropriate.

Plausible But Unlikely Predictions

Plausible but unlikely predictions are predictions of events which could possibly take place, but based on the information that has been presented, such events are unlikely to happen.

Inappropriate Predictions

Inappropriate predictions are predictions that are implausible given the facts that have been presented.

Probed Condition

The probed condition is the treatment in which the subjects are asked at the end of each division of the story to tell what they think will happen next.

Unprobed Condition

The unprobed condition is the treatment in which subjects are asked at the beginning of the story to tell all that they think as they read.

Proficient Reader

A proficient reader in this study was one whose vocabulary and comprehension scores on the standardized screening test were above the seventy-eighth percentile.

Less Proficient Reader

A less proficient reader in this study was one whose vocabulary and comprehension scores on the standardized screening test were below the fifty-fifth percentile.

Interpretive Level

The interpretive level refers to the level of comprehension at which the reader analyzes, synthesizes and evaluates the information given. A specific aspect of the interpretive level is predicting outcomes which involves hypothesizing beyond that which is given (Ruddell, 1974).

Applicative Level

The applicative level refers to the level of comprehension at which the reader can transform, utilize and apply the information given in order to develop an explanation or reason for his conclusion. (Ruddell, 1974).

Convergent Hypotheses

Convergent hypotheses are hypotheses which are based primarily upon the data or information provided by the author and the logic rather than the imagination of the reader (Smith and Barrett, 1974).

Divergent Hypotheses

Divergent hypotheses are hypotheses which are based on the information provided by the author and on the imagination and creativity of the reader (Smith and Barrett, 1974).

Cognitive Memory Productions

Cognitive memory productions are responses which are simple restatements of facts from the story.

Convergent Productions

Convergent productions are responses which indicate that the subject has performed an analysis and integration of the information presented by the author. The response is formulated according to a tightly structured framework which leads to one expected answer.

Divergent Productions

Divergent productions are responses which indicate that the subject has generated his own ideas, gone beyond the information given. In these productions, the subject constructs a relationship between ideas, integrates old data and new to create new possibilities.

Evaluative Productions

Evaluative productions are responses which deal with a judgment or a choice. In these productions, the subject may judge a character's intentions or actions. Modifications of prior conclusions or judgments also were placed in this category.

Development of Research Questions and Hypotheses

Research questions concerning the nature of the predictive process were formulated to guide the study. These questions addressed both qualitative and quantitative aspects of prediction. The former were investigated by means of an informal analysis of the subjects' responses and the latter by the statistical analysis of the scores achieved on certain variables. The informal analysis of the data suggested methods of classifying the responses and provided the scores on the variables which were compared.

The questions for which no null hypotheses were generated were tested by the informal analysis of the data. These are listed below

along with the research questions whose null hypotheses were tested by statistical analysis.

Research Question 1

- a) Do proficient and less proficient readers in grades four and six anticipate and predict coming events when reading continuous discourse?
- b) Do less proficient readers in grades four and six predict as frequently as do proficient readers when reading continuous discourse?

Hypothesis 1.0:

There is no significant difference in the number of predictions made due to

- 1.1 grade
- 1.2 group
- 1.3 treatment.

Research Question 2

Is there a difference in the number of appropriate predictions made by proficient and less proficient readers in grades four and six when reading continuous discourse?

Hypothesis 2.0:

There is no significant difference in the number of appropriate predictions made due to

- 2.1 grade
- 2.2 group
- 2.3 treatment.

Research Question 3

Is there a difference in the number of plausible but unlikely predictions made by proficient and less proficient readers in grades four and six when reading continuous discourse?

Hypothesis 3.0:

There is no significant difference in the number of plausible but unlikely predictions made due to

- 3.1 grade
- 3.2 group
- 3.3 treatment.

Research Question 4

Is there a difference in the number of inappropriate predictions made by proficient and less proficient readers in grades four and six when reading continuous discourse?

Hypothesis 4.0:

There is no significant difference in the number of inappropriate predictions made due to

- 4.1 grade
- 4.2 group
- 4.3 treatment.

Research Question 5

- a) Is there a difference in the extent to which proficient and less proficient readers in grades four and six support the responses they make when reading continuous discourse?

- b) Do proficient and less proficient readers in grades four and six base their predictions on clues drawn from the same sources when reading continuous discourse?

Hypothesis 5.0:

There is no significant difference in the number of supported responses due to

5.1 grade

5.2 group

5.3 treatment.

Research Question 6

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of cognitive memory productions given in response to stories?

Hypothesis 6.0:

There is no significant difference in the number of cognitive memory productions given due to

6.1 grade

6.2 group

6.3 treatment.

Research Question 7

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of convergent productions given in

response to stories?

Hypothesis 7.0:

There is no significant difference in the number of convergent productions given due to

7.1 grade

7.2 group

7.3 treatment.

Research Question 8

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of divergent productions given in response to stories?

Hypothesis 8.0:

There is no significant difference in the number of divergent productions given due to

8.1 grade

8.2 group

8.3 treatment.

Research Question 9

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of evaluative productions given in response to stories?

Hypothesis 9.0:

There is no significant difference in the number of evaluative productions given due to

9.1 grade

9.2 group

9.3 treatment.

Research Question 10

On a test of comprehension based on the stories read, is there a difference in the scores of the proficient and less proficient readers in grades four and six?

Hypothesis 10.0:

There is no significant difference in the scores on a comprehension test due to

10.1 grade

10.2 group

10.3 treatment.

Research questions 11 and 12 which follow were tested by informal analysis, therefore no null hypotheses were generated for these.

Research Question 11

Are there patterns of responses which characterize proficient and less proficient readers in grades four and six when responding to stories?

Research Question 12

Is there a relationship between the number and kinds of predictions given and the structure and content of the stories read?

Assumptions

Four assumptions upon which the investigation was based are:

1. That the tasks presented assessed the cognitive processes involved in prediction.
2. That the subjects' verbal report of the processing of information reflected the nature of the cognitive activity performed.
3. That the act of reporting the thoughts did not drastically distort the nature of the thinking that normally would be involved in silent reading.
4. That the cognitive operations initiated by the four stories selected were representative of the subjects' responses to literature, generally.

Limitations of the Study

The following limitations of the study are recognized:

1. The subjects for the study were grades four and six students selected on the basis of their proficiency in reading. They are not representative of all the grades four and six population.
2. The subjects reported only the thinking processes of which they were aware. Cognitive operations about which they were not conscious can **only** be inferred.

3. The segmentation of stories into divisions presents a task which differs to some extent from the regular reading situation.

4. Considering the wide variety of kinds of stories available, only a limited sampling of organizational patterns has been used in this investigation.

5. Responding to stories and giving reasons for responses during the silent reading presents a somewhat unnatural reading situation and could alter the thinking process.

Significance of the Study

The significance of the study rests in its contribution to a better understanding of the cognitive processes involved in prediction in reading. The investigation has provided empirical evidence for the reality of prediction and has illuminated the predictive process in readers at various levels of cognitive development and of reading proficiency.

The study has provided insight into the levels of thinking involved when maturing readers respond to literature and has suggested patterns of cognitive activity which tend to characterize proficient and less proficient readers in grades four and six. It has defined not only the kinds of predictions made by these readers but has provided information concerning the selection-rejection techniques and the types of clues utilized by subjects in formulating hypotheses.

Since the investigation was of an exploratory nature, it was designed to generate instructionally-oriented research rather than to have direct classroom applicability. However, some of the findings

have pointed directly to desirable classroom practices which elevate the level of thinking in which children engage. The study has contributed to an understanding of the developmental nature of ideational prediction strategies as they may occur in reading comprehension.

Overview of the Organization of the Investigation

The organization of the report of the investigation reflects the order in which the study was conducted. Chapter II contains the theoretical framework and reviews the literature related to the investigation. The design of the study is presented in Chapter III. Chapters IV and V describe the statistical and qualitative analyses of the data and discuss the findings from these analyses. Chapter VI contains a summary of the findings, the conclusions drawn from the research and the implications of the results of this study.

CHAPTER II

THE BACKGROUND OF THE STUDY

The theoretical considerations which provide the framework for a study of patterns of prediction in reading will be examined in this chapter. A review of related literature and research reveals a considerable commitment to the importance of prediction in reading but provides limited evidence that the reader does, in fact, predict beyond the level of word identification. The tendency for the topic to be treated under a multiplicity of titles makes the task of synthesizing relevant theory and research somewhat onerous. Because of the relationship of prediction to such competencies as critical reading, drawing inferences and establishing reading purposes, it will be necessary to sample a variety of areas in reading in order to provide background for the study and to portray the multi-faceted nature of prediction.

The first section of the chapter will examine the relationship between reading and thinking in order to provide a rationale for investigating the levels of thought involved in response to stories. This will be followed by a consideration of the nature of perception and cognition and the significance of prediction in each of these processes. Contributions of cognitive psychologists to the field of reading will be acknowledged. Information gained from the tachistoscopic perceptual studies by psychologists will be extended to the area of reading.

Early theoretical statements of reading experts will be cited to indicate the significance assigned by authorities to the ability to read beyond the lines. The relationship of prediction to other aspects of reading comprehension will be assessed. The present state of knowledge concerning the nature of prediction will be considered. A review of the use of introspective techniques in studies of reading and a brief summary of the focus of the study will conclude the chapter.

Relationship Between Reading and Thinking

The complex relationship between reading and thinking, although not completely understood, is clearly recognized. Stauffer (1976) stated that the reading process is akin to the thinking process. Thorndike (1917) equated reading and reasoning and Russell (1965) maintained that critical reading is the application of critical thinking to the reading process. References to reading as discovery, decision-making, or problem-solving, which are scattered liberally throughout the literature, emphasize the reasoning nature of skilled reading.

Because reading is a process involving thinking, conceptualization and decision-making, it has come under the influence of cognitive psychology and increased attention has been given to the processes involved in comprehension. Research which illuminates the thinking process of the reader as he encounters the information presented by the author certainly contributes to a better understanding of the reading process. This study seeks to determine the levels of thought involved in the response of the reader to literature and to relate these to the predictive process.

Whereas research has provided some information regarding the nature of the cognitive operations involved in reading, it has also revealed some of the difficulties involved in the investigation of covert processes. Kagan and Moss (1963) identified stable individual preferences in cognitive styles which tend to influence one's mode of perceptual organization and conceptual categorization of information. Piaget traced stages in the development of cognitive strategies. Vygotsky (1962) emphasized the developmental nature of both thought and language and the constant interplay between the two. An examination of the thinking processes involved in ideational prediction must give due consideration to all of these complexities. Rawson (1969) expressed concern about the need for educators to realize that there is a lag between the acquisition of operations in reasoning in concrete and in reading situations. An investigation of prediction not only must examine the cognitive operations involved but must consider the readiness of the subjects to perform these operations.

One method used in this study to examine the mental operations of the subjects is that which was employed by Gallagher (1965) to classify the verbal interaction of academically talented students at the junior and senior high school levels. He adapted Guilford's (1959) model of the structure of the intellect as a means of examining the levels of thought involved in the interaction. Guilford's model organizes the primary mental abilities according to the contents of information, the operations of information and the products resulting from the processing of information. It is the operations of information that are of particular interest in this study.

Gallagher's (1965) classification of data into four categories -- cognitive memory, convergent thinking, divergent thinking and evaluative thinking -- has been useful in this investigation. The questions raised in Gallagher's research about the adequacy of the Guilford model as a system of analyzing classroom interaction apply, as well, to its use in the analysis of children's responses to stories. Gallagher concluded that:

Divergent thinking and convergent thinking call for similar mental operations since both demand the use of logical syllogisms. The distinctive characteristic in divergent thinking is the large number of syllogisms required (p. 5).

Difficulties arise when one attempts to assign responses to specific thought categories. Usually there are elements of several categories involved in any response.

Taba's (1966) research further emphasized some of the difficulties involved in examinations of and training in the use of complex mental operations. The fact that researchers use diverse terminology to describe essentially similar cognitive operations or styles of thinking makes it almost impossible to translate their results into educational strategy. Taba states:

As general qualities of thought, these styles are not directly learnable or teachable because they describe qualities or characteristics which transcend the several categories of specific thought processes, such as forming concepts, generalizing and inferring from data and applying principles to explain, predict or hypothesize (p. 9).

In her study, Taba (1964) included the explanation and prediction of new phenomena by applying new principles and facts as one of the methods

of extending the thinking of elementary school children. It is with knowledge of the limitations of the Guilford model that it is selected for use in this study to provide a means of categorizing the predominating levels of thought involved in the responses made to stories by senior elementary school children.

The combination of methods used in studies of thought processes and in studies of reading is suggested by the close relationship which exists between the two processes, reading and thinking. Some authors have alluded to the possibility of differences in the predictive process in skilled and unskilled reading. Williams (1976) identified skilled reading as "a process in which the reader samples the cues together with previous knowledge both about printed pages and about the world" (p. 44). The reader forms hypotheses, or expectations, which are confirmed or disconfirmed by subsequent samplings. Stauffer (1969) stressed the predictive nature of skilled reading, in particular. The levels of thinking of both proficient and less proficient readers were considered in this study in order to examine the differences which may exist in the predictive process due to the proficiency level of the readers.

Gallagher found that cognitive memory, a simple restatement of contents, was the most prevalent level of thought displayed by his subjects. This was followed in fluency by convergent thinking, an analysis of given data by responding in a tightly structured framework which leads to one expected result.

An investigation of the cognitive operations involved in reading reveals differences which exist at various stages of mental development.

A study of the predictive process in reading must take these differences into account. Piaget (1967) noted that the age of seven marks a decisive turning point in mental development when the child moves from intuition to logic. In addition to causality and concepts of conservation, there is mastery of time, rate and space concepts at this age. It is in this stage that the logical operations essential to the genesis of general concepts or 'classes' develop. With the approach of formal operations, the adolescent develops a facility for elaborating abstract theories. The transition from concrete to formal thinking, the beginning of 'hypothetico-deductive' thinking, has been suggested to take place at age eleven to twelve. The new ability of the child to reason about hypotheses presented verbally should be reflected in his ability to predict when reading. He should now be able to reflect upon and consider possible action. Formal operations engender a 'logic of propositions'. In order to predict outcomes and sequences of events, the reader must be able to project himself into the realm of the possible and the probable. Maier (1965) stated that the adolescent finds pleasure in this "new power of manipulating ideas... in anticipating all the possible cases...all possible eventualities" (p. 151). Inhelder and Piaget (1958) distinguished between the hypotheses generated at the concrete operational level and those of the adolescent. The hypotheses of the concrete operational child no more than outline plans of possible action rather than consisting of "imagining what the real situation would be if this or that hypothetical condition were fulfilled" (p. 248). The responses to literature of subjects in grades four and six should reflect some of these developmental trends.

Cultural differences and individual differences in venturesomeness with respect to the use of cues doubtless exist (Bruner, Goodnow and Austin, 1956). Willingness to sustain indecision, tolerance for ambiguity, the amount of information one requires before making a decision and the amount of risk one is willing to take are listed as factors contributing to these differences. All of these personality factors are involved and relate to the nature of prediction in reading. Kagan (1965) distinguished children who were impulsive in making perceptual and conceptual judgments and jumped rapidly to conclusions from those who were more reflective and deliberate. The reflective in his group were more skilled in reading than were the impulsive.

The cognitive nature of the strategies involved in reading suggests the need for caution in assigning tasks to young readers. The operations required of the child must be commensurate with his level of intellectual functioning (Stauffer, 1970).

Perception and Cognition

For some time experts in the field have been seeking to construct a theory of reading which recognizes both the perceptual aspects and the cognitive operations involved. They accept the fact that both perceptual and cognitive processes are involved in the comprehension of written discourse, but are unable to agree as to the nature of the relationship between perception and conception. Whereas Piaget has been accused of "attempting to divorce thinking from perception and to minimize their mutual interrelatedness" (Wohlwill, 1968), Ausubel (1968) has stated that "once the message becomes meaningful...the two processes,

cognition and perception, become telescoped into one" (p. 57).

Because this close relationship exists and because both operations are influenced by the expectations of the perceiver, a study of prediction must examine both of these processes. Some generalizations from the tachistoscopic studies of cognitive psychologists can be extended to the field of reading.

Some theorists claim that on the perceptual as well as on the conceptual level, human beings tend to classify and categorize in order to reduce the strain on short term memory. They develop a schema for organizing incoming information. For Bartlett (1932) this schema was a means of organizing past experiences to facilitate remembering. For Vernon (1954) it operated in perception to tell the perceiver what to expect and to tell him how to classify data. As categories become more available to the learner, the amount of input required diminishes. In the ready perceiver, minimal input initiates the process of categorization, hypothesizing and confirming. Both Neisser (1967) and Bruner (Bruner, Goodnow and Austin, 1956) described a constructive process comprised of an inferential leap from some of the features of an object to a category or hypothesis followed by a confirmation check in which the hypothesis is tested against additional properties of the object. Clearly, these operations are involved in prediction in reading. Russell (1965) noted the implications for reading research:

The Bruner-Postman three-step cycle of expectancy, input of information, and checking of hypothesis would seem to offer many leads to reading research. For example, they say the stronger the set or hypothesis, or category, the

less information needed to confirm it, the more needed to change it (p. 10).

That reading is a selective process in which the reader selects cues from perceptual input on the basis of his expectations in order to set up hypotheses to be confirmed or rejected is a tenet stated by Goodman (1967) and Smith (1971).

One reason for the dearth of literature attempting to explicate prediction in reading is the fact that the predictive process is a composite of interrelated skills and abilities each comprised of an assortment of complex operations which themselves need to be explained. In order to gain information about prediction it is necessary to explore the cognitive style of the reader, the ease with which he engages in probability thinking, his ability to make inferences beyond the information given, to make the cognitive leap referred to by Bruner. These are all aspects of cognition which are little understood.

The expectations of the perceiver have been found to influence perceptual and conceptual decisions. Cognitive-oriented theories of perception have sought to explain the significance of this influence through the use of tachistoscopic experiments. The influence of set or selective attention has been stressed (Neisser, 1967; Bruner, Goodnow and Austin, 1956). Gibson (1969) pointed out that "we do not just see, we look for, we do not just hear, we listen".

The idiosyncratic nature of perception and cognition is another characteristic which relates the two processes. For Bruner (1951) perception must be idiosyncratic, being dependent upon personality, attitudes, needs and values, as well as upon the state of readiness of

the perceiver. The tuned perceiver is able to proceed with minimal information because of cognitive readiness which assists him "not only in perceiving what is before him but in foreseeing what is likely to be before him" (Bruner, 1964, p. 232). The fewer the alternatives available, the more readily confirmable is the hypothesis (Bruner, Miller and Zimmerman, 1955). The tendency for subjects to see what they want to see and to overlook the unpleasant (Bruner and Goodman, 1947; Bruner and Postman, 1947) is further indication of the idiosyncratic nature of perception and cognition. Ample evidence has been provided by cognitive psychologists to support the reality of these tendencies on the perceptual level. Presumably, many of these same factors operate in the predictive process in reading. Empirical evidence is required to support this conclusion.

Piaget explains the relationship between perception and cognition by assigning a directive role to the intellect. Perception for Piaget involves assimilation of sensory input to a schema and accommodation of the schema to the environment. The schemata resulting from repetition have the effect of directing exploration. Perceptual activities become less autonomous and increasingly directed by intellectual processes as development proceeds. The interdependence of perception and thinking is a major tenet of the theory of Wohlwill (1968) who regards perception and conception as poles on a continuum. In view of the parallel between the processes of reading and thinking presented above, it would appear that an extension of conclusions drawn from perceptual studies to the predictive process in reading might not be out of order. Ausubel (1968) stressed the importance of

the availability in cognitive structure of relevant "anchoring ideas" in determining the meaningfulness of material to the learner. He noted the influence of "advance organizers" on perception and cognition. In discussing children's drawings (but pointing out that the significance extends beyond the sphere of drawing), Piaget (1955) stated that the "child sees only what he knows and what he anticipates" and "one is struck by the extent to which his vision is distorted by his ideas" (p. 190).

The foregoing observations indicate the need for an investigation of the thought processes involved in prediction in reading. The perceptual studies provide evidence of the psychological reality of prediction on the levels of letters, words and sentences. Although the literature contains statements confirming a belief in prediction on the ideational level, there is little evidence cited to substantiate the claim. This study is designed to provide evidence to support a belief that ideational prediction operates in reading.

Prediction and Reading

A review of early reading literature suggests that prediction has long been recognized as an important element of reading comprehension. Huey (1908), one of the first to oppose narrow definitions of reading as a mechanical perceptual act, recognized that what is being read can "hang suspended" while the attention wanders backward and forward to get fuller meaning. He considered a question of Professor James which appears pertinent:

How comes it about that a man reading something aloud for the first time is able immediately to emphasize all his words aright, unless from the very first he have a sense of at least the form of the sentence to come...? If we read "no more", we expect presently to come upon "than".... A noun in a certain position demands a verb in a certain mood and number, in another position it expects a relative pronoun (pp. 130-131).

Thorndike (1917) commented upon the way in which the reader must "select, repress, soften, emphasize, correlate and organize, all under the influence of the right mental set or purpose or demand" (p. 329). He was one of the first scholars to include the reader's purpose as an important aspect of the way in which he interprets meaning.

Others, while not speaking of prediction 'per se' emphasized the reasoning, problem-solving or decision-making nature of reading. There was a tendency for the skill of predicting outcomes to be subsumed under such titles as "purposes for reading" (Smith, 1966) or "critical reading" (Wolf, King and Huck, 1968). Smith found that ninth grade students profited from direct instruction in purposeful reading. One of the twelve skills she selected for use in the study was predicting outcomes. Wolf, King and Huck found that children in grades one to six can be trained to read critically. The tendency for prediction to be treated under a variety of titles makes the task of synthesizing what is known about the process all the more difficult and confuses the investigation of an area of reading that already is only vaguely understood.

Investigations concerning the effectiveness of certain questioning techniques have provided information about the predictive process. The practice of including in reading tests some questions in which the reader is required to predict is fairly common. Guszak (1967) identified

"Conjecture" -- anticipating what may happen next in the story -- as a category of questions in his study. He reported that of 1857 question-response sequences collected, inferential type questions (conjecture and explanation) accounted for approximately fourteen percent of the total. Jenkinson (1968) stressed the importance of posing provocative questions by the teacher. She noted the need for the child to develop the "ability to anticipate outcomes, to make an 'educated guess', to draw simple conclusions or inferences; to transcend the bounds of the situation, but to recognize the limitations imposed by the writer" (p. 180).

Since prediction is related to the use of context, some information can be gained from the investigations of the reader's ability to process context as an aid to meaning (Laing, 1974; Goodman, 1970; Ames, 1965; Tulving and Gold, 1963; McCullough, 1943). The manner in which the reader selects clues in order to formulate hypotheses will determine the nature of his predictions. It is hypothesized that there is a relationship between the reader's awareness of context clues and the frequency and quality of ideational prediction. His language facility, his familiarity with syntactic structures and his substantive knowledge are related to his ability to predict. Jenkinson (1957), although not investigating prediction as such, found that her subjects used literal, contextual and ideational aids to comprehension in completing cloze tests. She reported that the proficient readers made more use of context in anticipation of the ideas and the meaning of the selection. The better readers made more tentative tries when facing uncertainty and

showed greater flexibility in shifting their approach or altering their interpretations to include the meaning of the whole passage.

Prediction has been treated as a branch of inferencing. In the "Taxonomy of Cognitive and Affective Dimensions of Reading Comprehension", Smith and Barrett (1974) treated prediction as an aspect of inferential comprehension. They identified convergent and divergent conjectures or hypotheses. Predicting outcomes was given as one of the examples of inferential tasks which go beyond the printed page.

Whereas prediction in reading is closely related to the ability to make inferences, the processes differ in the amount of structure that is provided. Closer constraints are placed upon the reader making inferences. The distinction resembles, to some extent, that which Bartlett (1932) made between extrapolation and interpolation. Both processes require an extension of the evidence presented in the text. Readers making inferences usually are provided with the terminal point and at least some evidence about the direction toward this point. Predicting, however, presents a somewhat different task. The reader, in addition to formulating new evidence to supplement that which has been given, is asked to discover or construct the terminal point while remaining loyal to the evidence presented. Inferencing, the gap filling process, might be referred to as reading between the lines; whereas predicting

extends this process to reading beyond the lines, a completion process. In predicting, the reader usually has available to him a larger number of alternatives from which to select. The fact that the terminal point has not been established allows him this greater freedom in formulating hypotheses. By providing a rationale for hypotheses, the reader learns to synthesize the literal content. Ruddell (1974) has divided comprehension into three levels: factual, interpretive and applicative. He included predicting outcomes in both the interpretive and applicative levels. Tasks in this investigation were assigned on both these levels.

A limited amount of attention has been given to the idiosyncratic nature of the strategies involved in prediction. That the reader's strategies relate to his expectations was demonstrated by Judd and Buswell (1922) who studied eye movements during reading and found that reading for different purposes involved different mental processes. In a study of critical reading in grades four, five and six Gans (1940) tested selection-rejection ability in children. Although she did not stress the relationship, it has been shown that others have recognized the process of selection, confirmation and rejection as essential components of prediction. Horn (1942) emphasized the constructive nature of comprehension:

The author moreover does not really convey ideas to the reader; he merely stimulates him to construct them out of his own experience. If the concept is already in the reader's mind, the task is relatively easy, but if, as is usually the case in school, it is new to the reader, its construction more nearly approaches problem-solving than simple associations (p. 154).

Early statements concerning the idiosyncratic nature of interpretation relate to prediction. Spenser (1950) noted that "We do not get meanings from stimuli but we make meanings out of them". Artley (1953) proposed that "Printed symbols serve only as triggers to release the thought processes". Russell (1958) summarized the many studies which have focused on the relationship of reading responses to personality predispositions. The relationship between the reader's attitude and his interpretation of the selection was demonstrated by McCaul (1944) and McKillop (1952).

Betts (1946) stressed the role of anticipation:

Reading requires the establishment of purposes; the association of new experiences with the individual's background, the anticipation of meaning...depending upon the purpose of reading and the type of material under consideration (p. 75).

Gray's (1960) model of reading also emphasized the importance of the reader's anticipation of events. His outline of activities involved in reading includes several activities which appear to be related to prediction. These include anticipating the oncoming ideas in the light of the preceding statements, making generalizations on the basis of facts presented and checking on the validity of one's conclusions. The skill of predicting outcomes was included in most skills lists in the basic readers.

A consideration of prediction in relation to syntactic

features of the material or the semantic features involved contributes to the understanding of the predictive process. Studies using letters, strings of letters and words (Miller, Bruner and Postman, 1947; Wallach, 1963) support a view of prediction based upon the redundancy of English orthography permitting the reader's use of minimal clues. Gibson, Osser and Pick (1963) found that children in early stages of development of reading skill already are beginning to generalize certain regularities and to notice abstract patterns of spelling to sound correspondences. Regularities in syntax are learned also. Gibson (1969) stated that:

It can be **argued** that the eye-voice span is not entirely a matter of what is perceived in a visual fixation, but is dependent also on the subject's ability to guess what would come next. The more constrained a chain of words, the better he should be able to predict what he has not yet seen (p.442).

She concluded that it is the ability to detect order and to make a single unit out of smaller units that makes it appear as though adults have a longer perceptual span than children. Neisser (1967) recognized the importance of the nature of the reading material upon perception.

While carefully noting the difference between reading and listening, Goodman (1970) compares the reader with the listener who is able to sample, predict and leap to the deep structure without using all the information available to him. Knowledge of syntactic structure and the redundancy of the language makes it possible to predict and anticipate the grammatical pattern on the basis of minimal clues. Comprehension depends upon the successful processing of grapho-phonetic, syntactic and semantic information. A series of abilities necessary to make the

process successful is illustrated in the Goodman Model of Reading . Although the model is basically one of decoding rather than one of comprehension, it depicts reading as a sampling, predicting, confirming process. The model is not extended to include an explication of ideational prediction. Research on oral reading miscues has provided insight into reading processes and supplied evidence that the reader makes predictions based on his expectations (Goodman, 1965; Goodman and Burke, 1968; Y. Goodman, 1967; Allen, 1969). The tendency for the reader to miscue because he draws from the peripheral field graphic information which confirms his expectations has also been demonstrated (Goodman, 1975).

Numerous authors have commented on the tendency of the reader to rely upon meaning to fill in the gaps as his eyes skim quickly across the page. Vernon (1962) explained how meaning facilitated the ability to perceive a large complex picture and suggested that it has the same effect in reading:

In reading a continuous text, the reader possesses in addition a knowledge of the familiar structure of the English language and of its most probable sequence of words. Thus once he has read a few words of the sentence, he can guess with fair accuracy what the remainder of the sentence may be. This is even more likely to occur in reading a continuous text on some familiar subject, since he then possesses expectations as to the general content. Thus we find that the literate adult does not even look at many of the words in such a text. Four or five brief glances at each line of the print are sufficient to produce enough perceptual impression to be filled out in the light of the meaning of the context (p. 110).

Vernon claimed that a great deal of the text is inferred from skeleton percepts, filled out by the reader's knowledge of the text. The tendency for the reader to regress when he loses the thread of the

argument or meets with information contrary to his expectations is suggestive of hypothesis testing.

Hochberg (1970) found it very difficult to make a distinction between "skilled reading" and "skimming", seeing them as points on a continuum of intention. The skilled reader samples the text in order to develop hypotheses about what the next string of symbols consists of. He then tests these expectations at appropriate places further along in the text. Already there is evidence for selective listening based upon the listener's anticipation of the message (Broadbent, 1958). Selective reading is based upon the reader's hypothesizing and the subsequent testing of his expectations. Hochberg suggested that the reader lessens the strain by guessing syllables, words or phrases, based on the redundancy of the text which enables him to anticipate the message and thus make fewer fixations. He states:

By responding to a few features seen in clear foveal vision with an entire word or phrase, the skilled reader, then has largely relieved himself of the necessity of looking closely at the text. He therefore needs to fixate only those parts of the array, further along the page, that will enable him to make new guesses and to check his previous ones (p. 310).

Hochberg viewed the practice of skilled reading as one of successive extrapolations in which the reader must move his eyes under the combined control of cognitive search guidance (CSG) and peripheral search guidance (PSG). Elkind (1976) described rapid reading as a process consisting of less motor involvement and more conceptual inferential activity. "In effect, in rapid silent reading the brain does more work and the eyes do less" (p. 336).

Writers who regard reading as one of the most complex forms of information processing have contributed the idea of the constant

"forward flow" of meaning imposed upon the input as the message is interpreted. This forward flow of meaning and the combination of input from a variety of sources is explicated by Geyer and Kolars (1974) who identify three stages of the reading process: the visual operations resulting in the recognition of letters and individual words, a sensitivity to the grammatical relationship between words in connected text, and the direct imposition and manipulation of meaning. To date studies relating to prediction have concentrated on the first two of these stages. There is a need to extend the exploration into the area of ideational prediction. The relationship between the use of experiential knowledge in predicting meaning and reading achievement of fourth grade students was investigated by Inglis (1974). His subjects were asked to identify pictures from successive clues and to supply a missing word in a sentence, a variation of the cloze technique. In this study the place of prediction was found to be related to intelligence.

Stauffer (1961) emphasizes the importance of allowing children to examine and evaluate their predictions at various points throughout the reading of a story and upon completion of the selection. He claims that the child is capable of evaluating and supporting his predictions in terms of their appropriateness or plausibility. As new information is received, the reader might want to redirect his purposes. Thorndyke (1976) explored the role of appropriate, plausible and inappropriate inferences in discourse comprehension. In the present study, it was hypothesized that the appropriateness of a child's predictions would be related to his comprehension of the story.

It is Smith (1971, 1975) who has extended the concept of

prediction into the ideational realm and who is the most explicit of the writers concerning the size of the unit involved. He states that the reader can predict a "word" because he knows what meaning he is looking for. He refers to the prediction of "units as large and as meaningful as possible" and to "the meaning of one or more sentences". Then he concludes that:

In fact prediction works better at these **broader** levels; it is easier to predict meanings rather than specific words or letters, and very few letters or words need to be identified to test prediction about meaning (Smith, 1975, p. 309).

Smith identifies prediction as the prior elimination of unlikely alternatives. The reader makes use of prior knowledge relevant to the material. He combines input from visual and non-visual information in order to answer his cognitive questions, thus reducing uncertainty. It is rarely necessary to predict precisely, but the reader can eliminate unlikely alternatives. In this way, making use of prior knowledge, he samples the surface structure only to the extent required to eliminate any remaining alternatives. Smith notes that psychologists call this 'hypothesis testing' and that teachers call it 'guessing'. He claims that prediction is essential for reading and that it is routinely practised by beginners as well as by fluent readers.

It is Stauffer who has made the greatest contribution in terms of translating into practice the theory underlying this study. The 'Directed Reading-Thinking Activities' approach has given classroom teachers a method which they can apply in both individual and group instruction in order to develop in the reader an attitude toward reading which is conducive to hypothesis testing. For several decades the concept

of reading as reasoning and the basal reader series built upon this view of reading have emphasized the importance of purpose setting and prediction in reading. Stauffer (1961) notes the difference in skilled and unskilled reading:

Stop an untrained pupil reading a story and ask him about events to come, and the likelihood is considerable that all the pupil will do is recite the details of the story up to the point of where he was stopped. A pupil trained to operate as a thinking reader will tell you not what has happened but what will happen next in the story. In so doing he will tell you why he thinks so and will cite as support for his thinking selected, relevant facts gleaned from the part just read (p. 20).

Stauffer (1969) adds that it is the reader's purpose for reading "that primarily determines how he will read, what he will read, and what he expects from what he reads" (p. 345) and that "Purposeful information-generating behavior yields cognitive processing economy and reading processing efficiency and makes it possible for the child to go beyond the information given" (p. 346).

The literature search uncovered no studies, focusing on prediction, in which the reader responded freely describing his thoughts as he read independently. Studies of response to literature mostly have considered reactions obtained after reading an entire story or poem. Squire (1964) devised a method of segmenting a short story at significant points in order to obtain reactions throughout the story. This method of segmentation and the oral mode of response were used in this study in order to elicit the reader's predictions. Squire's ninth and tenth grade students were asked to respond freely in describing their "feelings, ideas, opinions or reactions" while reading. The method revealed certain patterns of responses and showed how the reader's interpretation of what

he reads is influenced by his personal predispositions and past experiences. Squire suggested that his method would be feasible with subjects in different age groups and with a variety of types of materials. Since the method appeared to be a viable means of determining if and to what extent the reader predicts, it was adopted for use in this study.

Although Squire drew no conclusions concerning the tendency for his subjects to anticipate future events or outcomes, reported responses contain numerous instances of predictions. Subjects in the study appeared to be "happiness bound" and regardless of the logic of events, were willing to draw conclusions which conflicted sharply with the facts presented. Because of their demand for clarity and certainty, some of the readers were unable to suspend judgments until complete information was given; instead they rushed to hasty conclusions based on fragmentary input. They appeared to cling tenaciously to their mistaken notions and to be unwilling to weigh evidence presented by the author. Such statements assign significance to the reader's anticipations and the relationship between these expectations and comprehension.

The views cited in this chapter, although not exhaustive, are intended to be representative of theoretical statements relating to prediction. It appears that there is agreement among writers in the field that prediction is operating, at least in proficient reading. However, the need for further exploration of the cognitive strategies involved in prediction has been disclosed. Evidence to show that all readers predict has not been found in the review of relevant research. Support has been provided for an exploration of the process

of prediction in children who are at various stages of cognitive development and whose proficiency in reading varies. This study sought to illuminate the predictive process by examining the responses made by proficient and less proficient readers in grades four and six.

Introspective Techniques in Studies of Reading

Adequate methods of investigation of the covert processes of reading continue to elude those who would explore these complex operations. Researchers in the field of reading have made ample use of the reader's verbal report of the thinking process to supplement conclusions drawn from an examination of the product in reading. The introspective technique has proved to be a useful device in conducting reading research. It is employed in this investigation to illuminate the thinking processes which initiate prediction in reading.

Although this section will consider the use of the introspective technique in studies of reading, the contribution of Wundt and his associates, who developed the method, and of scholars such as Duncker (1945), Piaget (1952) and Bloom and Broder (1950) should be noted. The method had been used to study the thinking processes, feelings and reactions of adults under certain experimental conditions during the latter part of the nineteenth century, then fell into disrepute for some years. Recent critics of the method include Neisser (1967) and Simons (1972).

The introspective approach to the study of cognitive processes involved in reading was first employed by Huey (1908) who asked his subjects to report on associations which came to mind as they read.

Buswell and Kersh (1956) used a similar method with high school students to examine their approach to problem solving.

Werner and Kaplan (1950) asked children between the ages of eight and thirteen to tell how they acquired word meaning from context. Four studies at the University of Chicago adapted Bloom's technique for their investigation of the reading process (Swain, 1953; Piekarz, 1954; Jenkinson, 1957; Letton, 1958).

Squire (1964) segmented short stories at appropriate points and asked readers to give their reactions at the end of each section in order to explore the ways in which the responses develop during the reading of the story. Laing (1974) used introspection to determine the use children in grades four, six and eight made of context to obtain meaning for unfamiliar words.

Investigators who have used the technique suggest that there are difficulties involved both in data collection and in analyzing the responses. Bloom and Broder (1950) pointed out that psychologically naive subjects cannot reveal as much of their thought processes as might be desired; however, they suggest that it is the most satisfactory method available. It has been suggested by Simons (1972) and Neisser (1968) that the reader may not be conscious of the thought processes involved. In spite of the limitations of the approach, the introspective technique has been adopted for use in this study as a means of assessing the cognitive processes involved in prediction. Huey's assessment, that despite the imperfections, it probably is the "sanest" method available appears to be a valid one. Those who have used the technique conclude that it yields valuable information about the reading process (Strang, 1970).

Summary: Focus of the Study

That the predictive process in reading has been pondered by experts in the field has been shown by the review presented. The paucity of suitable methods of examining internalized reading-thinking processes has retarded the acquisition of knowledge concerning ideational prediction. Yet prediction, on the level of ideas, appears to be an important aspect of reading comprehension. There remains a need to explain the nature of ideational prediction and the significance of its role in the reading process.

Prediction in reading requires that the reader utilize not only the visual array with which he is presented, but that he call into service many non-visual factors in order to formulate hypotheses. Prior knowledge, past experience and many affective factors contribute to the multi-faceted nature of the predictive process.

Factors within the reader -- cognitive style, venturesomeness, self-concept, and his perception of the task -- influence both the quantity and quality of the predictions given. Certainly the reader's use of language plays an important part in ideational prediction. The proficient reader, with better comprehension of the selection, avoids some of the pitfalls which impede the predictive process in the less proficient. The latter's undue attention directed toward sorting out story details minimizes his concentration on coming events and prevents him from setting up his own purposes to guide his reading.

It is possible that the quantity and quality of predictions are influenced by certain factors within the materials presented. The

relative importance of the structure and content of the stories in determining the nature of the predictions needs to be explored. There is a need to examine the kinds of clues within the material upon which the readers focus.

Theory and research have been cited to suggest the developmental nature of the thinking process. The interrelatedness of reading and thinking suggests that the ability to predict in reading may be developmental, as well. Before such conclusions can be drawn it is necessary to examine the predictive process in subjects at different age levels and of different levels of reading proficiency.

This study focused on the responses made by subjects in grades four and six as they read four stories, two independently and two with probing. An examination of the number and kinds of predictions given and the reasons subjects offered for making their predictions illuminated the nature of the ideational predictions in proficient and less proficient readers. Information gained from the literature suggested methods of exploring and methods of analyzing the reading-thinking process.

CHAPTER III

THE DESIGN OF THE STUDY

The purpose of the study was to investigate the processes involved in prediction in reading by students in grades four and six. The research design created to explore these processes is the subject matter of this chapter. Included will be a description of the analysis of selected instructional materials, the construction of the stimulus materials, the results of two pilot studies, the selection of the subjects who participated in the study and the procedures used in collecting and analyzing the data.

Analysis of Selected Instructional Materials

An analysis of instructional materials at the grades four and six levels of the Gage Strategies for Language Arts series was carried out in order to determine whether children in these grades are required in school to predict when reading. The materials examined from this series include:

- (1) People Like Me (4). (Thorn and Richmond, 1972)
- (2) Comprehension Strategies 1. (Thorn and Richmond, 1972)
- (3) How Many Miles? (6). (Thorn, Braun and Richmond, 1974)
- (4) Comprehension Strategies 3. (Thorn, Braun and Richmond, 1974)

The results of the analysis are summarized in Table 3.1.

Table 3.1

Selections from Instructional Materials Requiring Predictions

Text	Number of Selections Requiring Predictions	Number of Questions
<u>People Like Me (4)</u>	3	14
<u>Comprehension Strategies 1</u>	3	31
<u>How Many Miles? (6)</u>	3	13
<u>Comprehension Strategies 3</u>	1	3

In addition to those shown above, the Teaching Strategies Source Books of this series contains several listening exercises in which the children are required to predict outcomes after listening to the teacher read short selections.

From the Winston Basic Readers (Stauffer, Russell G.; Burrows, Alvina and Horn, Thomas, 1961), the Teachers Edition Around the Bend and Teachers Edition Skyways to Tomorrow were analyzed to determine the emphasis the authors placed upon prediction at levels four and six.

It was found that setting purposes and speculating about coming events is one of the principal skills developed in the series during group-directed reading activities. In all selections the authors direct the teacher to allow purpose setting sessions in which the children make predictions either from pictures and the title before reading the story or at various points throughout the story. The authors emphasize the importance of allowing children to check their purposes and evaluate their predictions. The accompanying Studybooks of this series provide practice exercises designed to develop the ability to predict. This analysis showed that predicting is a skill required of students in grades four and six.

Construction of the Stimulus Materials

Ten stories differing in organizational pattern and resembling those in the New Practice Readers (Stone and Grover, 1962) and the Reading Progress Book (Quick, 1961) were written at an early fourth grade level. Readability for the stories was checked with the "Dale-Chall Readability Formula" (Koenke, 1971). The readability levels of the passages are given in Table 3.2. It is recognized that in presenting the same stories to all subjects, most fourth graders were assigned a more difficult task than were their counterparts in grade six. However it is considered important to use the same stimulus material for all subjects.

Table 3.2
Organizational Patterns of Stories

*Pattern	Story	Readability Level
Cause-Effect	Lazy Luke	4.4
	A Pearl for a Queen	4.2
Cumulative Information	The Most Dangerous Animal	4.5
	Man's Worst Enemy	4.4
Sequence (Predicting Outcomes)	Moose Shooting	4.4
	A Dog's Tricks	4.0
Problem Solving	On the Spot	4.3
	The Robbery	4.1

* Cause-Effect - Given a cause, predict an effect.

Cumulative Information - Given a thought-provoking title and successive clues, predict the identity of the subject.

Sequence (Predicting Outcomes) - Given several clues throughout the story, predict an unlikely outcome of a sequence of events.

Problem Solving - Given an eventful story with a problem, predict a solution.

Assigning a specific organizational pattern to a story is a difficult task since, in practice, it is rare that a single pattern exists throughout. Usually a text contains a mingling of several organizational patterns. However, it was hypothesized that the patterns of the stories might influence the number and kinds of predictions elicited. For this reason there was an attempt to categorize stories according to a predominating pattern. The passages (Appendix B) were designed to elicit predictions in a variety of situations. They included both description and simple narrative prose. The story "The Most Dangerous Animal" (DA) is information-type prose. "Lazy Luke" (LL) and "Moose Shooting" (MS) are simple narrative prose, the former emphasizing causal relationships and the latter being more concerned with temporal sequencing. "On the Spot" (OS) has the additional element of problem-solving and is the longest story in the group. The names of the stories and the patterns involved are given in Table 3.2, along with explanations of the terms used to describe the patterns. The readability level of the passages also is given.

Two other stories ("Chippy's Choice" and "Frontier Dangers") were written because the original intention was to use separate selections in the probed and unprobed conditions. However, early in the planning stage, the decision was made that the same stimulus material would be used for both treatments. The passages listed as cumulative information are information-type prose designed, in particular, to elicit convergent hypotheses. The others could be placed at various points along the convergent-divergent continuum, with "On the Spot"

tending to elicit the largest number of divergent hypotheses.

The passages were segmented in a manner similar to that employed by Squire (1964), yet with slight variations from one organizational pattern to another. The number of divisions ranged from five in "Lazy Luke" where divisions were placed between a cause and its effect to eight in "On the Spot" which was the longest story in the group. Most stories consisted of six divisions (Appendix B).

In his study, Squire examined the way in which responses to literature develop during the reading of selected short stories by grade nine students. As a teaching implication from his research, he suggested the segmenting of stories to allow students to predict. The present study focused specifically on the predictions given by fourth and sixth grade readers in response to segmented stories. Prior to the segmentation the passages were checked informally with several children in order to determine the points at which they were most likely to make predictions. Both convergent and divergent hypotheses were elicited.

A fifteen-item multiple choice test was constructed to measure the subject's comprehension of each story (Appendix C). Both literal and inferential questions were included. Wherever possible, items focused on likely prediction points. It was hypothesized that an analysis of the subjects' performance on individual items would indicate whether inaccurate predictions influenced their interpretation of the story. A five-item test consisting of open-ended questions was constructed as an alternate means of measuring comprehension (Appendix C).

Pilot Study 1

A pilot study was conducted in November 1976 in an elementary school in Halifax, Nova Scotia. Twelve fourth graders and twelve sixth graders were involved in this pilot project. At each grade level the classroom teacher designated six of these subjects "proficient readers" and six "less proficient readers". This classification was based on the teachers' observations of daily performance and consideration of previous test results recorded on the cumulative record cards.

The purposes of this pilot project were as follows:

- (1) to determine the effectiveness of the passages in eliciting the subjects' predictions.
- (2) to further check the appropriateness of the points of segmentation.
- (3) to select from the ten passages the four which elicited the largest number of responses.
- (4) to determine the most appropriate means of checking the subjects' comprehension of the stories.
- (5) to refine directions to be given in the major study.
- (6) to familiarize the investigator with problems which might arise in tape recording the sessions.

Each subject read three of the ten stories, made his responses, and did both types of comprehension test on each story read. In some of the stories the subjects were stopped at appropriate points and asked, "What do you think will happen next?" (Hereinafter called the "Probed Condition"). At several of these points, in the probed condition, the questions varied slightly to fit the context (eg.,

"What will Father do next?") but always the assignment of predicting coming events was maintained. In other stories the subjects were instructed at the beginning of the story to "tell all that you think as you read" (Hereinafter called the "Unprobed Condition").

From this pilot study four stories were selected for use in the research project. These were "The Most Dangerous Animal", "Lazy Luke", "Moose Shooting" and "On the Spot". These stories were chosen because their subject matter appeared to be of interest to the children and because these four stories elicited a larger number of responses than did the other stories.

The multiple choice test rather than the open-ended questions was selected as the comprehension measure because it was found that scoring the answers to open-ended questions either "correct" or "incorrect" presented many problems. In addition, the larger number of items on the multiple choice test appeared more productive for analysis.

Since some of the subjects were uncomfortable with the assignment, "Tell all that you think as you read", it was decided that a demonstration would be given by the investigator in the major study (Appendix E).

Because some of the less proficient readers in grade four were unable to comprehend the stories, it was decided that for the research no child would be selected whose achievement on the standardized screening test was less than grade 3.5.

Pilot Study 2

A second pilot study was conducted in December 1976 in an elementary school in Edmonton, Alberta. Six fourth graders and six sixth graders were selected by their teachers, with three proficient readers and three

less proficient readers in each grade. The purposes of this project were as follows:

- (1) to determine the effectiveness of a demonstration by the investigator of telling "all that you think as you read".
- (2) to determine whether the silent or oral mode of reading would be used in the research.
- (3) to further check the suitability of individual multiple-choice items.

In this project each subject read two stories, one probed and one unprobed, and did the multiple-choice comprehension test. The presentation of the stories was arranged so that each of the four stories (DA, LL, MS, OS) was read in each of its conditions (Probed and Unprobed) by at least one proficient and one less proficient reader at each grade level. The investigator demonstrated telling "all that you think as you read" using a story which had been eliminated from use in the major study. The investigator used a portion of the story leaving the remaining portion for the subject to use as practice material. Some stories were read orally and some silently. Responses were recorded for analysis.

It was found that the demonstration given prior to reading helped the subjects to respond more freely than they had in the first pilot study. Because the tendency to report what the story was about continued to persist, the sentences, "I do not mean for you to tell me what the story is about. Tell me just the things you think about as you read it," were added for use in the directions.

Because concern with accurate word identification when reading

orally appeared to decrease the number of responses given by some of the subjects, silent reading was selected for use in the major study.

In order to give each subject ample opportunity to predict in both probed and unprobed conditions, it was decided that for the research project each subject would read all four stories, two probed and two unprobed, according to the plan shown in Appendix D. To check the reader's ability to support his hypotheses, tasks were devised on both the interpretive and applicative levels. The subjects were asked to tell why they responded as they did.

Questions on the multiple choice test which appeared too simple, too difficult, or in any way unsuitable were discarded. Thus the tests were reduced to ten items each.

The Sample

The population from which the sample was drawn involved two elementary schools assigned by the Superintendent of Elementary Education for Halifax City Schools. One of these schools was deliberately chosen because the investigator had worked previously with the staff and students in this school and had some knowledge of the reading programs that had been followed over a period of years. An exploration of the predictive process in subjects who had not had previous extensive training in the DR-TA approach was considered appropriate for the purposes of the investigation. It was felt also that the children would respond freely to the stories and the interview because, in most cases, rapport had already been established with the investigator. The school is located in an area of the city where the parents of these children would be considered mostly middle class wage

earners.

Since the results from the screening test showed that not enough of these subjects scored within the limits of the criteria (to be described below) that had been set, another class of grade six students was randomly selected from the neighbouring school. From the subjects scoring within the predetermined limits, thirty-two were chosen as the sample for the study.

Students of grades four and six were selected because basic word identification skills should have been mastered by this time. In addition, since Inhelder and Piaget (1958) suggest that there is a difference in the ability of children at the stages of concrete operations and formal operations to deal with the possible, and since predicting requires the child to move into the realm of the probable and the tentative, the period from grade four to grade six should be one of significant development.

Eight boys and eight girls were selected from each grade. The students ranged in age from 9 years 10 months to 12 years 7 months. The average age of the grade four subjects was 10 years 1 month. The average age of the grade six subjects was 12 years 1 month.

The students were classified according to their scores on two subtests of the Canadian Tests of Basic Skills, Form 3. The Vocabulary and Reading Comprehension subtests were administered by the investigator during the first two weeks of May, 1977. Each class took the test separately and in one sitting. Results were hand scored. The means and range of scores are shown in Table 3.3.

Table 3.3

Composition of Reading Groups According to Grade, Sex and Scores on the C.T.B.S.

Grade	Number of Subjects		Reading Group	Vocabulary		Comprehension	
	Boys	Girls		Grade Mean	Score Range	Grade Mean	Score Range
4	4	4	Less Proficient	4.33	3.8-4.8	4.59	4.1-5.7
4	4	4	Proficient	6.28	5.8-6.7	6.08	5.7-6.5
6	4	4	Less Proficient	6.13	5.6-6.8	5.90	4.2-6.9
6	4	4	Proficient	8.29	7.9-9.0	8.04	7.8-8.2

Subjects who scored above the seventy-eighth percentile on both the Vocabulary and Reading Comprehension sections of the test were designated "Proficient Readers". Those who scored below the fifty-fifth percentile on both the Vocabulary and Reading Comprehension sections were designated "Less Proficient Readers". From those who qualified as proficient readers four boys and four girls at each grade level were randomly selected for the sample. From those who qualified as less proficient readers four boys and four girls at each grade level were randomly selected. No child was chosen who had repeated a grade or whose vocabulary or reading comprehension score on the screening test was less than grade 3.5. In all, thirty-two subjects were selected. Table 3.3 gives the composition of the groups according to grade, sex and scores on the test.

Testing Instruments

Although intelligence was not a criterion for selection of the

experimental sample, the Peabody Picture Vocabulary Test was administered so that the subject's reaction to the research assignment could be considered in relation to his intelligence. Table 3.4 gives the means and the range of scores for each group. Tables 3.3 and 3.4 show that whereas there are discrete groups when scores on reading tests are considered, there is considerable overlap in terms of scores on the intelligence test.

Table 3.4

Means and Range of Scores on the Peabody Picture Vocabulary Test

Grade	Reading Group	Mean	Range
4	Less Proficient	108.75	92-121
4	Proficient	122.75	105-135
6	Less Proficient	103.50	85-124
6	Proficient	121.00	106-146

Four stories, "The Most Dangerous Animal", "Lazy Luke", "Moose Shooting and "On the Spot", constructed as described above, were presented to each subject in order to explore the number and kinds of predictions made by pupils in the various achievement groups. A complete set of directions is found in Appendix E. Stories, segmented as described in the previous section, were presented in small booklets with each segment appearing on a separate page of the booklet. The segments were presented as separate pages so that they would not serve to stimulate comments in the unprobed treatment to any greater extent than would the completion of a page in the normal reading situation. This also removed the opportunity for the subject to skim ahead in the story when asked to make a prediction.

There was a slight variation in the directions given for the story, "The Most Dangerous Animal". Instead of asking the subject to identify the animal at the end of each segment, a general direction was

given in the beginning asking the subject to tell each time he changed his mind about the identity of the animal. This decision was made because in the pilot study it was found that the subject named a new animal simply because he was asked to do so regardless of whether he had, in fact, changed his mind.

A ten-item multiple choice Test of Comprehension based on each of the four stories was administered to check the subject's understanding of the passages. There was no time limit on any of the comprehension tests. In both the stories and the tests the subjects were instructed to ask the investigator to supply any words which were unfamiliar.

Collection of the Data

The data for the study were obtained between May 6 and June 10, 1977. The tasks were presented by the investigator individually to the thirty-two subjects in two separate sessions of approximately forty-five minutes each. One session was scheduled in the morning between 9:00 and 11:30. The other session was scheduled in the afternoon between the hours of 1:30 and 3:00. Data collected during the sessions were tape recorded and transcribed by the investigator.

In the first forty-five minute session a brief period was spent in interviewing and establishing rapport. The purpose of the meeting was explained. The subject's role was outlined. This was followed by the presentation of the Peabody Picture Vocabulary Test. The subject then read and responded to one of the four stories and did the comprehension test based on that story. If the first story was "unprobed", the administration of this passage was preceded by the demonstration and practice session for telling "all that you think as you read". The demonstration

was designed to include a wide variety of types of responses (Appendix E).

In the second forty-five minute session the subject read, in the order which had been predetermined, the remaining three stories and did the comprehension tests based on these passages. In all each subject read and responded to four stories, two probed and two unprobed. They were asked to give reasons for their responses. Directions for reading the passages in both the probed and unprobed conditions are included in Appendix E.

A pattern of presentation was designed to ensure the same order of presentation in each of the four groups (Appendix D). Thus the first subject in each group read the passages in the same order and under the same conditions (Probed or Unprobed). A different pattern was devised for the second child in each group, continuing in this manner until patterns of presentation had been devised for all eight subjects. In addition, the presentation pattern was designed so that each story was read in each condition by a proficient and a less proficient reader in each group and by a male and a female. Appendix D shows the order of presentation according to story, treatment (Probed or Unprobed), and to the sex and proficiency level of the reader.

Upon completion of the tasks for each story, subjects were told that they were "doing a fine job" or "being a big help" to the investigator.

Analysis of the Data

The study was of an exploratory nature seeking to illuminate the processes involved in prediction in reading. The question guiding

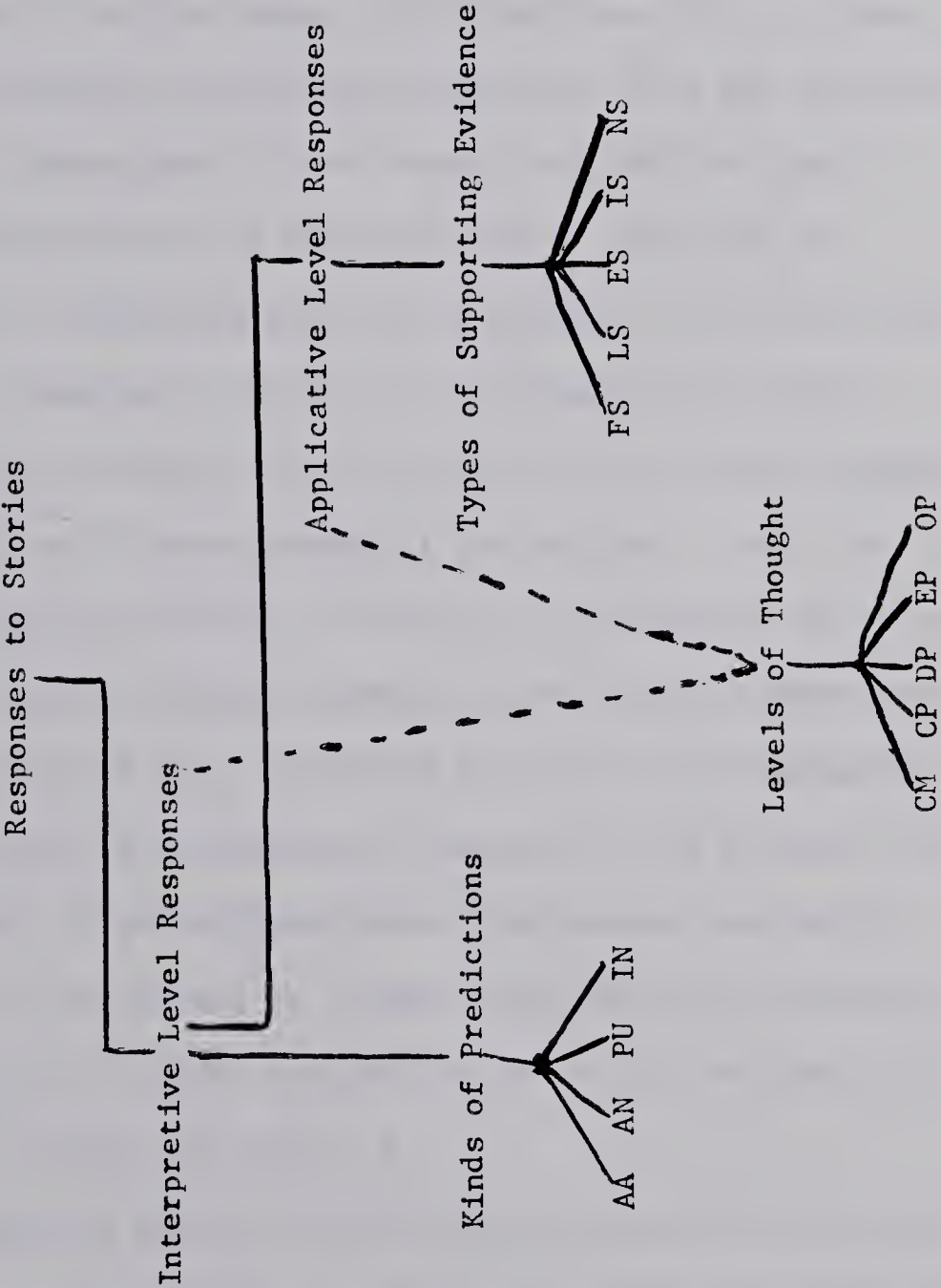
the research was whether, in the predictive process, there are general patterns of cognitive operations involved which characterize groups of individuals or if the thought processes involved in prediction in reading are idiosyncratic.

The first phase of the analysis of the data consisted of an examination of the interpretive level responses to identify the number of predictions made by each subject. It became obvious that some of the predictions given were more appropriate than others. Step two of the analysis consisted of the development of a system of classification of predictions based upon the quality of the speculation. The four categories sorted the predictions into those that were appropriate and in accord with story events (AA), those that were appropriate but not in accord with story events (AN), those predictions that were plausible but unlikely (PU) and the inappropriate predictions (IN).

Step three of the preliminary analysis involved an examination of the reasons the subjects gave for thinking as they did. It was found that they gave four types of supporting evidence for their interpretive level responses. These were assigned to the categories, factual support (FS), logical support (LS), experiential support (ES) and irrelevant support (IS). A fifth category (NS) was used to classify responses for which the subjects offered no supporting evidence. The chi square technique was applied in order to determine the significance of the differences in preference for the various types of supporting evidence.

The initial analysis of the subjects' responses to four stories indicated that there were differences in the cognitive operations involved in prediction. Categorization of the responses according to

Figure 3.1
Method of Analyzing Responses



the operations identified by Guilford's (1959) model of the structure of the intellect provided a means of quantifying the data. One variation, a combination of the first two operations "cognition" and "memory" to form the category "cognitive memory" (CM), made the model more applicable to this study. The other categories included convergent productions (CP), divergent productions (DP) and evaluative productions (EP). The category other productions (OP) was used to classify responses which did not belong in any of the other four classes. Figure 3.1 summarizes the various phases of the qualitative analysis and the categories to which the responses were assigned.

Scores were calculated for the multiple choice tests designed to measure the subjects' comprehension of the stories. Step five consisted of an informal analysis of incorrect responses in order to gain insight into the relationship between prediction and comprehension.

Percentage scores were calculated for each of the categories discussed above so that a comparison of responses could be made regarding the number and kinds of predictions given, the types of supporting evidence offered and the levels of thought involved in the responses. This step completed the initial analysis of the data. The results of this analysis are reported in Chapter V.

As an additional means of exploring the nature of prediction some of the data were submitted to statistical analysis. Two three-way analyses of variance, performed on ten dependent variables, permitted comparisons between grades, across groups and between the two methods of treatment. The findings from the three-way analyses of variance are reported in Chapter IV. Where interaction effects were found, Scheffé

tests were performed. A list of the ten variables submitted for statistical analysis follows:

1. Number of Predictions
2. Number of Appropriate Predictions
3. Number of Plausible but Unlikely Predictions
4. Number of Inappropriate Predictions
5. Number of Supported Responses
6. Number of Cognitive Memory Productions
7. Number of Convergent Productions
8. Number of Divergent Productions
9. Number of Evaluative Productions
10. Scores on Comprehension of Stories.

Coefficients of correlation were computed among the scores on the ten dependent variables used in the three-way analyses of variance and the results of the standardized reading and intelligence tests.

An explanation of the categories used to describe the data are provided below along with examples taken from the responses given by the subjects.

Kinds of Predictions

The response, in the probed condition, was the subject's reply to the question, "What do you think will happen next?" In the unprobed condition subjects were instructed to "Tell all that you think as you read". Whenever it was appropriate, they were asked, "Why do you think that?" The responses were analyzed separately for the two treatment conditions.

Upon completion of phase one, in which the predictions given by each subject were counted, phase two of the analysis which involved an examination of the quality of predictions was carried out. The appropriateness of the speculations varied from group to group. A description with examples of the four kinds of predictions identified will follow.

Appropriate and in accord with story events (AA). In these responses the subjects were able to guess future events as they happened in the story.

Example: Subject #6, Grade six, less proficient reader:

When he falls into the stream the sponges will swell up

 and get heavier.

Appropriate but not in accord with story events (AN). In these responses subjects made appropriate and believable predictions but they were not able to guess the exact turn of events.

Example: Subject #3, Grade four, less proficient reader:

Is it a rat?

Plausible but unlikely predictions (PU). These were predictions of events which could possibly take place, but based on the information that had been presented, such events were unlikely to happen. In most cases subjects making these predictions had overlooked some of the information or had not recognized the significance of some of the information given.

Example: Subject #8, Grade six, proficient reader:

The Indians will come in and take the medicine.
.....

Inappropriate Predictions (IN). These were predictions that were implausible, given the facts that had been presented. The responses either contradicted the facts or overlooked the major portion of the information that had been given.

Example: Subject #6, Grade six, less proficient reader:

(She will) put some of the drink on her so the Indians
.....
can't see her.
.....

Supporting Evidence

In response to the question, "Why do you think that?" subjects offered four types of supporting evidence for their interpretive level responses. An explanation with examples of each type of supporting evidence will follow.

Factual support (FS) represents statements which make either a direct reference to the print ("It says...") or a very near approximation of what is on the printed page.

Example: Subject #7, Grade four, proficient reader:

Because it says, "I'm going to teach Luke a lesson."
.....

Logical support (LS) represents statements which show that the subject is connecting facts from the story and reasoning toward a

conclusion. Many of the logical support statements were of the form "Because ... happened, then ... will happen".

Example: Subject #6, Grade four, proficient reader:

Because, well he'd like those antlers for his set, so he

 probably shot some other moose.

Experiential support (ES) represents explicit statements of personal experiences as reasons for conclusions. Also assigned to this category were statements which were generalizations based on the subject's experiential knowledge.

Example (1): Subject #3, Grade six, proficient reader:

Because I can remember once when I was small I saw a

 program like that.

Example (2): Subject #3, Grade six, less proficient reader:

~~They~~ like being in dirty places.

Irrelevant support (IS) represents statements which showed little or no relation to the responses they were intended to support. Statements which were merely restatements of the responses they were intended to support were also assigned to this category.

Example (1): Subject #8, Grade four, less proficient reader:

Because it just slipped into my mind.

Example (2): Subject #7, Grade four, less proficient reader:

Because the animal might come around and kill them.

No support (NS): This category included the response, "I don't know". In addition, there were some responses for which a subject offered no supporting evidence or indicated by a gesture, such as shaking his head, that he did not know why he thought as he did.

Levels of Thought

Since one of the purposes of the study was to examine the cognitive operations involved in prediction, responses were categorized according to the levels of thought inferred from the statements given. The five categories, based on the Guilford model, which served as a method of classifying the responses are described below. Examples taken from the data are given for each of the levels.

Cognitive memory productions (CM) represent the simple restatement of facts from the story. Responses in which the subject repeated all or part of a sentence directly from the text or those in which he recited several disconnected portions of the presentation of events were placed in this class.

Example (1): Text

"Well I got two good shots anyhow," Jerry said as he headed home to develop the film.

Response: Subject #1, Grade six, less proficient reader:

They shot two good shots and went home so they could

develop the film.

Example (2): Text

It was their nearest neighbour. Mr. Blackburn. He
 looked worried.

Response: Subject #4, Grade six, less proficient reader:

It was their nearest neighbour and he looked worried.

Convergent productions (CP) represent an analysis and integration of the information given in the story. The response is formulated according to a tightly structured framework which leads to one expected answer. Responses which indicate that the subject is summing up, stating the main idea of a paragraph or drawing a conclusion were placed in this category.

Example (1): Subject #5, Grade four, proficient reader:

These animals could be rats.

Example (2): Subject #8, Grade four, proficient reader:

It could be the person who had found the sheep.

Divergent productions (DP) represent responses which indicate that the subject has generated his own ideas, gone beyond the information given. In these productions, the subject constructs a relationship between ideas, integrates old data and new to create new possibilities.

Example (1): Subject #6, Grade six, proficient reader:

The donkey got an idea, maybe to take a wider sweep
around the stream.

Example (2): Subject #6, Grade four, proficient reader:

Well, I think that when the Indians see the red spots,
they'll think that they have measles and they'll
probably flee very fast.

Evaluative productions (EP) represent responses which deal with a judgment or a choice. In these productions the subject may judge a character's intentions or actions. Statements in which a subject modified a prior conclusion or judgment were also placed in this category.

Example (1): Subject #5, Grade four, proficient reader:

Barry shouldn't have put the salt on the donkey's back
in the first place... It was Barry's fault.

Example (2): Subject #6, Grade six, proficient reader:

I was wrong, he's not a person he's a donkey.

Other productions (OP) were statements which did not fit easily into one of the categories described above. These consisted of responses which had little relation to the text or were obvious misinterpretations of the material read. Responses such as "I don't know" or "I wonder" and several responses which were only partially audible, and hence

impossible to classify with certainty, were placed in this category.

Example (1): Subject #4, Grade four, less proficient reader:

The donkey will help him get up, shove him up, and the

 donkey will help him put the salt on the donkey's back.

Example (2): Subject #5, Grade four, proficient reader:

They go in barns and kill the horses. The horses get

 fewer and fewer.

Since as suggested in Chapter II, in any response there may be aspects of several of the above-mentioned categories, a judgment was made as to the predominating level of thought involved in the response and the total response was then assigned to that category. For example, in some of the divergent productions, the subjects made several restatements of facts (cognitive memory productions) from the text, then went beyond the information given (divergent productions) to predict an outcome. In this event, the total response was assigned to the divergent production (DP) category. It is in this sense that the classification is considered a broad categorization of responses.

The Reliability of the Analysis of the Responses

Since assigning the responses to the various categories involved a degree of subjectivity, three independent judges were engaged in establishing the reliability of the classification. The three judges, doctoral students as well as experienced teachers, participated in a

training session to learn the categories. Each judge then analyzed eight protocols, one probed and one unprobed selected at random from each of the four groups.

The reliability of the three sets of classifications was calculated according to the Arrington formula (Feifel and Lorge, 1950, p. 5). The percentage of agreement between the investigator and each of the independent judges was calculated and is presented in Table 3.5.

Table 3.5

Percentage of Agreement Between the Investigator and Each of Three Independent Judges in Classifying Responses

Independent Judges	Kinds of Predictions	Supporting Evidence	Levels of Thought	Total
1	66.6	84.4	66.6	72.9
2	88.6	91.9	74.6	85.7
3	81.5	88.8	87.0	85.5

Although the percentage of agreement was fairly satisfactory, particularly between the investigator and two of the judges, it was felt that further clarification of the definitions would result in still greater agreement. After a second session designed to clarify any difficulties in utilization of the classification, the same three judges analyzed four more protocols, one from each of the four groups. The results of this analysis are given in Table 3.6.

Table 3.6

Revised Percentage of Agreement Between the Investigator and Each of
Three Independent Judges in Classifying Responses

Independent Judges	Kinds of Predictions	Supporting Evidence	Levels of Thought	Total
1	94.1	97.1	87.4	93.0
2	93.3	91.2	98.0	94.7
3	90.9	94.1	90.9	92.0

It can be seen that on kinds of predictions, types of supporting evidence and levels of thought, the revised percentage of agreement between the investigator and Judge 1 was 94.1, 97.1 and 87.4 respectively. With Judge 2 and Judge 3 the percentages of agreement were 93.3, 91.2, 98.0 and 90.9, 94.1, 90.9 respectively. When this result is compared with other similar studies (White, 1947; Squire, 1964), this percentage of agreement is considered acceptable.

Summary

The study was an investigation of ideational prediction in reading. The thirty-two subjects were proficient and less proficient readers in grades four and six, selected on the basis of their achievement on the vocabulary and comprehension subtests of the Canadian Tests of Basic Skills, Form 3.

Data collection took place during two individual interviews in which introspective techniques were used. A descriptive analysis permitted the classification of the data and provided scores which were then submitted to statistical analysis. Other methods of informal analysis were determined by the nature of the subjects' responses.

CHAPTER IV

FINDINGS: STATISTICAL ANALYSIS OF THE DATA

The categorization of the responses as outlined in Chapter III produced scores for each subject on the number of predictions, kinds of predictions, types of supporting evidence, levels of thought and on the comprehension of the stories read. This information was punched on data cards and processed by computer at the Division of Educational Research Services at the University of Alberta. The stories were separated for the statistical analysis so that all subjects who were compared were probed or unprobed on the same stories. "The Most Dangerous Animal" and "Lazy Luke" were grouped for one analysis and "Moose Shooting" and "On the Spot" for the other.

Two three-way analyses of variance were performed guided by the following hypotheses:

- 1.0 There is no significant difference in the number of predictions made due to
 - 1.1 grade
 - 1.2 group
 - 1.3 treatment.
- 2.0 There is no significant difference in the number of appropriate predictions made due to
 - 2.1 grade
 - 2.2 group
 - 2.3 treatment.
- 3.0 There is no significant difference in the number of plausible but unlikely predictions made due to
 - 3.1 grade
 - 3.2 group
 - 3.3 treatment.

- 4.0 There is no significant difference in the number of inappropriate predictions made due to
 - 4.1 grade
 - 4.2 group
 - 4.3 treatment.
- 5.0 There is no significant difference in the number of supported responses due to
 - 5.1 grade
 - 5.2 group
 - 5.3 treatment.
- 6.0 There is no significant difference in the number of cognitive memory productions given due to
 - 6.1 grade
 - 6.2 group
 - 6.3 treatment.
- 7.0 There is no significant difference in the number of convergent productions given due to
 - 7.1 grade
 - 7.2 group
 - 7.3 treatment.
- 8.0 There is no significant difference in the number of divergent productions given due to
 - 8.1 grade
 - 8.2 group
 - 8.3 treatment.
- 9.0 There is no significant difference in the number of evaluative productions given due to
 - 9.1 grade
 - 9.2 group
 - 9.3 treatment.
- 10.0 There is no significant difference in scores on a comprehension test due to
 - 10.1 grade
 - 10.2 group
 - 10.3 treatment.

The data from the two sets of stories were analyzed by two three-way analyses of variance, grouping by grade, proficiency level and treatment. The analyses were computed over ten variables. The first analysis was concerned with responses to the two stories, "The Most

Dangerous Animal" (DA) and "Lazy Luke" (LL) and the second with "Moose Shooting" (MS) and "On the Spot" (OS). Where significant interaction effects were revealed, Scheffé tests were applied. Since the Scheffé procedure is more rigorous than other procedures, an alpha level of .10 was set for determining the significance of the interaction. This level has been recommended by Scheffé (1959) and by Ferguson (1976) and is considered acceptable.

Correlations were computed among the scores on the ten dependent variables and the standardized reading and intelligence test scores. The results of this analysis are presented in Appendix I.

The first section of this chapter will present the results of the statistical analysis of interpretive level responses to the four stories. It will be concerned primarily with hypotheses one through four, considering the numbers and kinds of predictions made by proficient and less proficient readers in grades four and six under two treatment conditions, probed and unprobed. This will be followed by the results of the analysis of applicative level responses, levels of thought and the comprehension scores.

Tables summarizing the results of the three-way analysis of variance tests are placed in this chapter for easy reference. Complete information from which the data in this chapter were compiled can be found in Appendices G and H. The Tables of Means, tabulated according to grade, group and treatment, which were used to plot the interaction graphs will be presented in this chapter where findings concerning the particular variables are described.

Interpretive Level Responses

The analysis of the interpretive level responses examined the number and kinds of predictions made by the readers. Variables one to four are considered in this section.

Dependent Variable One: Number of Predictions

Table 4.1 gives the mean scores and the total number of predictions given in each of the groups. The scores show that in almost all cases subjects gave more predictions when reading with probing. The grade six subjects predicted more frequently than did the fourth graders.

The differences revealed by the three-way analysis of variance are summarized in Table 4.2 in which grade, group and treatment are represented by A, B and C respectively. It can be seen that on variable one in neither set of stories was there a significant effect due to grade. Consideration of Source B, proficiency level, shows that in all stories there were significant effects due to group (DA & LL: $p < .02$; MS & OS: $p < .001$). Proficient readers made more predictions than did the less proficient. Significant differences due to treatment (DA & LL: $p < .00$; MS & OS: $p < .03$) favoured the probed condition. There were significant interaction effects between grade and group ($p < .007$) and between group and treatment ($p < .002$) in DA & LL.

The significant interaction effects indicated by the analysis are graphed in Figure 4.1. The grade-group interaction graph shows that the greatest difference in the number of predictions was between the less proficient and proficient grade six subjects. Proficiency level appeared to differentiate more clearly in grade six than in grade

Table 4.1

Mean Number of Predictions

Subjects	Grade	Group	Stories	Predictions		Predictions Unprobed	Mean	
				Probed	Unprobed		Probed	Unprobed
4	4	Less Proficient	DA & LL	35	13		8.75	3.25
4	4	Proficient	DA & LL	28	17		7.00	4.25
4	6	Less Proficient	DA & LL	32	6		8.00	1.50
4	6	Proficient	DA & LL	33	34		8.25	8.50
4	4	Less Proficient	MS & OS	38	12		9.50	3.00
4	4	Proficient	MS & OS	42	36		10.50	9.00
4	6	Less Proficient	MS & OS	27	17		6.75	4.25
4	6	Proficient	MS & OS	51	42		12.75	10.50

Table 4.2

Summary: Three-Way Analysis of Variance - Number of Predictions

Stories	*Source	F-Ratio	Probability	Decision
DA & LL	A	1.19	.2868	N.S.
	B	5.57	.0267	Sig.
	AB	8.44	.0077	Sig.
	C	27.72	.0000	Sig.
	BC	11.90	.0020	Sig.
	AC	.53	.4747	N.S.
	ABC	2.11	.1593	N.S.
MS & OS	A	.17	.6878	N.S.
	B	12.11	.0019	Sig.
	AB	.90	.3521	N.S.
	C	5.31	.0301	Sig.
	BC	.90	.3521	N.S.
	AC	.35	.5624	N.S.
	ABC	.74	.3990	N.S.

* A - Grade

B - Group

C - Treatment

four. However, when the Scheffé test (Table 4.3) was applied, differences were not wide enough to reach the required level of significance (.10) to isolate the source of the interaction effects. The group-treatment interaction graph indicates that the less proficient readers were influenced by probing to a far greater extent than were the proficient readers. The difference between the probed and unprobed scores of the less proficient readers was found to be significant when the Scheffé test was applied.

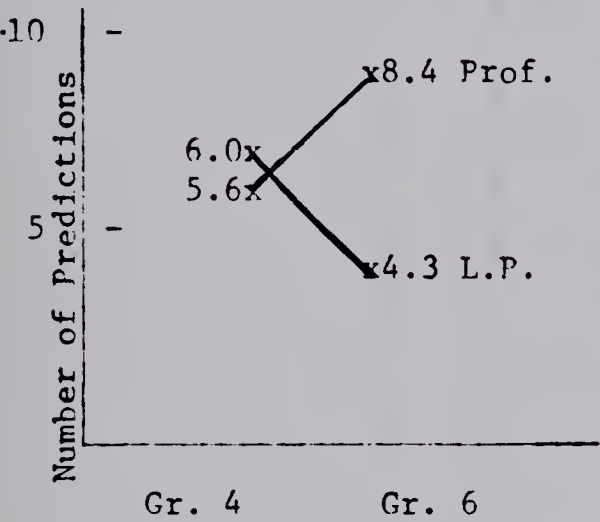
When coefficients of correlation were computed between the number of predictions and the other variables (Tables 4.4-4.7), a positive relationship, significant at the .001 level, was revealed between this variable and the number of appropriate predictions, which is not surprising since the tasks assess the same skill. Tables 4.5 and 4.7 show that the positive relationship between the ability to predict and the ability to support responses was most evident in the unprobed condition (Gr. 4: $r = .75$; Gr. 6: $r = .66$). The negative relationship, significant at the .05 level for probed grade four subjects (Table 4.4), between the number of predictions and the number of cognitive memory productions reflects the tendency for some of the subjects to retell the story rather than anticipate coming events. It can be seen in Tables 4.5, 4.6 and 4.7 that a positive relationship, significant at the .05 to the .001 level, was revealed between predictions and the number of divergent productions for unprobed grade four subjects ($r = .90$) and for grade six subjects (Probed: $r = .54$; Unprobed: $r = .90$). Readers were more likely to predict when thinking divergently about the material read.

With both sets of stories revealing significant effects due to

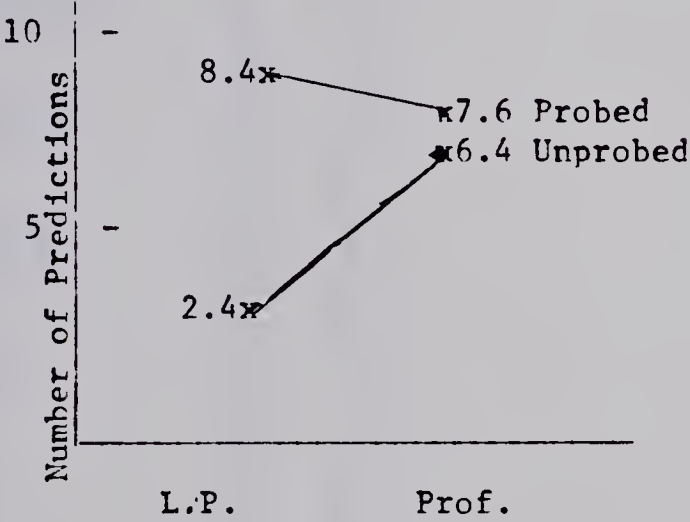
Figure 4.1

Significant Interactions Graphs: Variable One -
Number of Predictions

Grade-group Interaction Graph



Group-treatment Interaction Graph



There were no significant interaction effects on this variable in MS & OS.

Table 4.3

Significant Interactions Revealed in DA & LL on Variable One:
Number of Predictions and Results of Scheffé Test

Significant Interactions	Scheffé Test
Group-treatment Interaction	N.S.
Grade-group Interaction	*Sig.

*Scheffé Test of Significance Between Groups

	LP Probed	LP Unprobed	Prof Probed	Prof Unprobed
LP Probed		*		
LP Unprobed				
Prof Probed				
Prof Unprobed				

Table 4.4
Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 4 Probed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.719**	.662**	-.321	-.031	-.458	-.374	-.628**	.538*	-.052	-.301	.078	-.453
2. Vocabulary (C.T.B.S.)			.874***	-.169	.137	-.464	-.420	-.534*	.830***	-.280	-.415	.200	-.377
3. Comprehension (C.T.B.S.)				.291	.476	-.476	-.625**	-.442	.846***	-.215	-.350	.201	-.374
4. Number of Predictions				.851***		-.132	.421	.495	-.089	-.198	-.180	.403	.007
5. Appropriate Predictions						-.509*	-.046	.311	.233	-.324	-.283	.420	-.103
6. Plausible Predictions							.218	.008	-.299	.055	.052	-.006	.139
7. Inappropriate Predictions								.434	-.591*	.291	.234	-.063	.174
8. Total Supported Responses									-.407	.321	.536*	-.191	.527*
9. Comprehension of Stories										-.481	-.375	.295	-.273
10. Cognitive Memory Productions											.681**	-.732***	.185
11. Convergent Productions												-.854***	.671*
12. Divergent Productions													-.619**
13. Evaluative Productions													

* $p < .05$ ** $p < .01$ *** $p < .001$

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

Table 4.5

Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 4 Unprobed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.719**	.662**	.261	.332	.176	-.390	-.025	.502*	-.159	-.277	.410	-.420
2. Vocabulary (C.T.B.S.)			.874***	.392	.505	-.110	-.219	-.162	.795**	-.181	-.483	.536*	-.206
3. Comprehension (C.T.B.S.)				.310	.387	.053	-.258	.152	.819***	.193	-.593*	.448	-.105
4. Number of Predictions					.969***	.392	.350	.754***	.371	-.296	.138	.903***	-.159
5. Appropriate Predictions						.227	.196	.702**	.463	-.289	.050	.918***	-.136
6. Plausible Predictions							.000	.274	-.017	-.130	.296	.227	-.218
7. Inappropriate Predictions								.436	-.218	-.080	.213	.234	.021
8. Total Supported Responses									.182	-.212	.034	.695**	.005
9. Comprehension of Stories										.186	-.492	.592	.171*
10. Cognitive Memory Productions											-.275	-.257	.450
11. Convergent Productions												-.028	.068
12. Divergent Productions													-.214
13. Evaluative Productions													

* p < .05 ** p < .01 *** p < .001

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

Table 4.6
Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 6 Probed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.720**	.522*	.592*	.603*	-.044	-.038	-.161	.265	-.154	-.191	.393	-.235
2. Vocabulary (C.T.B.S.)			.869***	.488	.538*	-.161	-.084	-.035	.183	-.173	-.087	.384	-.515*
3. Comprehension (C.T.B.S.)				.451	.570*	-.180	-.311	.095	.360	-.080	.089	.236	-.555*
4. Number of Predictions				.926***	.926***	-.031	-.235	.248	-.094	-.065	-.103	.544*	-.305
5. Appropriate Predictions						-.297	-.088	.289	.103	-.027	.033	.450	-.364
6. Plausible Predictions							.188	-.089	.301	.071	-.120	-.029	.347
7. Inappropriate Predictions								-.090	-.471	-.382	-.390	.330	-.038
8. Total Supported Responses									.031	.492	.710**	-.354	.047
9. Comprehension of Stories										.231	.361	-.437	.048
10. Cognitive Memory Productions											.574*	-.507*	.112
11. Convergent Productions												-.755***	-.088
12. Divergent Productions													-.226
13. Evaluative Productions													

* $p < .05$ ** $p < .01$ *** $p < .001$

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

Table 4.7
Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 6 Unprobed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.720**	.522*	.292	.299	-.352	.109	.144	.599*	-.306	-.057	.280	.175
2. Vocabulary (C.T.B.S.)			.869***	.631**	.622**	-.357	.285	.518	.645**	-.543*	.111	.584*	.089
3. Comprehension (C.T.B.S.)				.670**	.648**	-.201	.331	.557*	.624**	-.469	.250	.619**	-.194
4. Number of Predictions					.992***	-.172	.185	.657**	.349	-.514*	.025	.899***	-.129
5. Appropriate Predictions						-.256	.067	.639**	.329	-.500*	-.004	.882***	-.124
6. Plausible Predictions							.333	-.200	.074	-.029	-.030	-.190	-.016
7. Inappropriate Predictions								.297	.169	-.134	.297	.279	-.047
8. Total Supported Statements									.175	-.442	.391	.618**	.081
9. Comprehension of Stories										.312	-.123	.365	-.186
10. Cognitive Memory Productions											-.117	-.401	-.168
11. Convergent Productions												-.216	-.258
12. Divergent Productions													-.087
13. Evaluative Productions													

* $p < .05$ ** $p < .01$ *** $p < .001$

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

group and treatment and neither set showing a significant difference in the number of predictions due to grade, hypothesis 1.1 was not rejected and hypotheses 1.2 and 1.3 were rejected.

Dependent Variable Two: Number of
Appropriate Predictions

Table 4.8 gives the mean number of appropriate predictions made in each of the groups. With the exception of the proficient sixth graders all groups had higher scores when probed. The differences revealed by the three-way analysis of variance are summarized in Table 4.9 where grade, group and treatment are represented by A, B and C respectively. There were no significant effects due to grade in the number of appropriate predictions given in either set of stories. For the DA & LL stories, however, the differences were approaching significance ($p < .06$) and favouring the sixth graders. An examination of source B, proficiency level, shows that in both sets of stories there were significant effects due to group (DA & LL: $p < .003$; MS & OS: $p < .001$) with the proficient readers making more appropriate predictions than the less proficient. In DA & LL there were significant effects due to treatment ($p < .00$) with the probed treatment resulting in more predictions than the unprobed. Although differences were not significant in MS & OS, where they did exist they favoured the probed treatment.

Figure 4.2 graphs the interaction effects which the analysis of variance indicated. The group-treatment interaction ($p < .006$) graph shows that the less proficient readers had the widest difference between their probed and unprobed scores. However the Scheffé test was unable to isolate the significant source of the interaction. The graph shows that subjects of both levels of reading proficiency made more appropriate

Table 4.8

Mean Number of Appropriate Predictions

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	5.75	2.00
4	Proficient	DA & LL	6.50	4.00
6	Less Proficient	DA & LL	7.25	1.50
6	Proficient	DA & LL	6.75	8.00
4	Less Proficient	MS & OS	7.00	2.50
4	Proficient	MS & OS	8.50	8.00
6	Less Proficient	MS & OS	4.25	3.50
6	Proficient	MS & OS	11.00	10.00

Table 4.9

Summary: Three-Way Analysis of Variance - Appropriate Predictions

Stories	* Source	F-Ratio	Probability	Decision
DA & LL	A	3.66	.0675	N.S.
	B	10.18	.0039	Sig.
	AB	1.40	.2476	N.S.
	C	15.37	.0006	Sig.
	BC	9.05	.0060	Sig.
	AC	.41	.5294	N.S.
	ABC	4.39	.0467	Sig.
MS & OS	A	.26	.6181	N.S.
	B	13.83	.0011	Sig.
	AB	1.32	.2623	N.S.
	C	1.54	.2271	N.S.
	BC	.47	.4976	N.S.
	AC	.36	.5562	N.S.
	ABC	.61	.4427	N.S.

* A - Grade

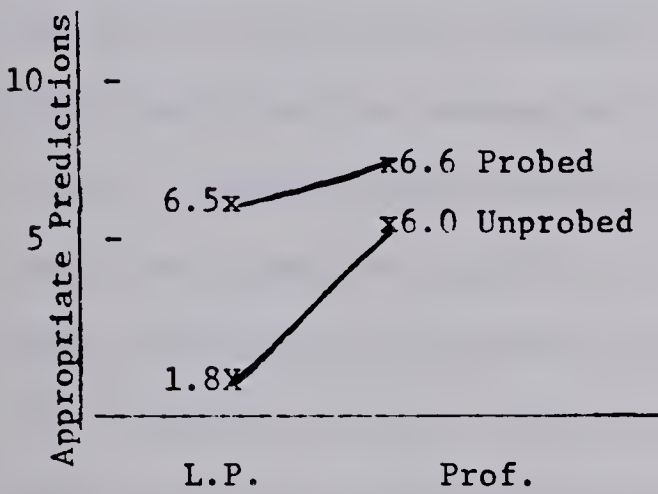
B - Group

C - Treatment

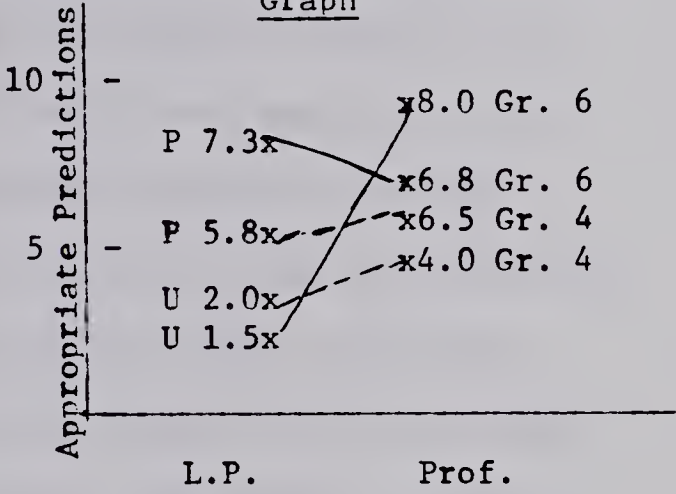
Figure 4.2

Significant Interactions Graphs: Variable Two -
Number of Appropriate Predictions

Group-treatment Interaction Graph



Grade-group-treatment Interaction Graph



There were no significant interaction effects on this variable in MS & OS.

Table 4.10

Significant Interactions Revealed in DA & LL on Variable Two:
Number of Appropriate Predictions and Results of Scheffé Tests

Significant Interactions	Scheffé Test
Group-treatment Interaction	N.S.
Grade-group-treatment Interaction	*Sig.

*Scheffé Test of Significance Between Groups

4LP-P	4LP-U	4Prof-P	4Prof-U	6LP-P	6LP-U	6Prof-P	6Prof-U
4LP-P							
4LP-U							
4Prof-P							
4Prof-U							
6LP-P							
6LP-U						*	
6Prof-P							
6Prof-U	*					*	

predictions when probed. The grade-group-treatment interaction graph ($p < .04$) summarizes the mean number of appropriate predictions for both grades under the two treatments and shows the interactions involved. Scheffé tests revealed that in the unprobed condition the proficient grade six readers made significantly more appropriate predictions than did either the less proficient grade six or the less proficient grade four subjects. Also, the scores of the less proficient grade six readers when probed were significantly higher than their scores without probing. The less proficient readers seemed to require structuring in the form of questions from the investigator in order to encourage them to make appropriate predictions.

Tables 4.4-4.7 show that the tendency to make appropriate predictions is positively related to the ability to support responses, significantly so in the unprobed condition (Gr. 4: $r = .70$; Gr. 6: $r = .64$). It can be seen in Tables 4.5 and 4.7 that a positive relationship was revealed between the number of appropriate predictions and the number of divergent productions given, reaching the .001 level of significance in the unprobed condition for both grades (Gr. 4: $r = .92$; Gr. 6: $r = .88$). Appropriate predictions generally related negatively to the number of cognitive memory productions. This relationship reached the level of significance only for the unprobed grade six subjects ($r = .50$). The negative relationship between appropriate predictions and plausible but unlikely predictions was significant only for probed grade four subjects (Table 4.4). It should be remembered that in some of the stories some groups had no plausible but unlikely predictions.

With neither set of stories revealing a significant difference

in the number of appropriate predictions due to grade, hypothesis 2.1 was not rejected. With both revealing significant effects due to group, hypothesis 2.2 was rejected. Since only one set of stories revealed a significant difference due to treatment, hypothesis 2.3 was not rejected.

It would appear that the nature of the stories influences the effect of probing on prediction in reading, since from time to time the analyses reveal different results from the two sets of stories. The differences in the results will be noted as they appear, but a discussion of this will be delayed until after the presentation of the findings of the qualitative analysis in Chapter V.

Dependent Variable Three: Number of
Plausible but Unlikely Predictions

Plausible but unlikely predictions (PU) were predictions of events which could possibly take place, but based on the information that had been presented, such events were unlikely to happen. Table 4.12 summarizes this analysis and shows that for the number of PU predictions made there were no significant differences due to grade (A), group (B) or treatment (C) in either set of stories. The Table of Means (4.11) indicates that the number of PU predictions given was small in all groups. Grade four subjects scored higher than the sixth graders and less proficient readers scored higher than the proficient readers. More PU predictions were given in the probed than in the unprobed condition. Because of the small numbers of predictions involved, this variable did not differentiate between the groups. It is possible that over a wider range of stories, and with a larger total

Table 4.11

Mean Number of Plausible but Unlikely Predictions

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	1.00	0.50
4	Proficient	DA & LL	0.00	0.00
6	Less Proficient	DA & LL	0.50	0.00
6	Proficient	DA & LL	0.50	0.00
4	Less Proficient	MS & OS	1.00	0.00
4	Proficient	MS & OS	0.50	0.50
6	Less Proficient	MS & OS	0.75	0.25
6	Proficient	MS & OS	0.50	0.00

There were no significant interaction effects on this variable for either set of stories. Therefore, no Scheffé tests were indicated.

Table 4.12

Summary: Three-Way Analysis of Variance -
Plausible but Unlikely Predictions

Stories	Source	F-Ratio	Probability	Decision
DA & LL	A	.43	.5198	N.S.
	B	3.86	.0612	N.S.
	AB	3.86	.0612	N.S.
	C	3.86	.0612	N.S.
	BC	.43	.5189	N.S.
	AC	.43	.5189	N.S.
	ABC	.43	.5189	N.S.
MS & OS	A	.21	.6533	N.S.
	B	.21	.6533	N.S.
	AB	.21	.6533	N.S.
	C	3.31	.0813	N.S.
	BC	.83	.3720	N.S.
	AC	0.00	1.0000	N.S.
	ABC	.83	.3720	N.S.

number of PU predictions, significant differences might appear. For the same reason, when coefficients of correlation were computed (Tables 4.4-4.7) significant relationships were not found between PU predictions and the other variables.

Because there was no significant difference in the number of PU predictions made due to grade, hypothesis 5.1 was upheld. Since neither set of stories revealed significant effects due to group or treatment, hypotheses 5.2 and 5.3 were not rejected.

Dependent Variable Four: Number of Inappropriate Predictions

Inappropriate predictions were predictions that were implausible given the information that had been presented. Table 4.13 gives the mean number of inappropriate predictions made by subjects in each group. Generally, there were more inappropriate predictions made when subjects were probed. The results of the three-way analysis of variance are summarized in Table 4.14 in which grade, group and treatment are represented by A, B and C respectively. There were no significant effects due to grade and group in the number of inappropriate predictions given (Table 4.14) in any of the stories. In DA & LL grade four subjects made more inappropriate predictions than did grade six subjects and in MS & OS an equal number was given from both grades (Table 4.13). Proficient readers had slightly higher scores in DA & LL and the less proficient readers had more inappropriate predictions in MS & OS. Significant effects due to treatment ($p < .00$) were revealed in MS & OS, with subjects having higher scores when probed. Figure 4.3 graphs the significant group-treatment interaction effect

Table 4.13

Mean Number of Inappropriate Predictions

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	2.00	0.75
4	Proficient	DA & LL	0.50	0.25
6	Less Proficient	DA & LL	0.25	0.00
6	Proficient	DA & LL	1.00	0.50
4	Less Proficient	MS & OS	1.50	0.50
4	Proficient	MS & OS	1.50	0.50
6	Less Proficient	MS & OS	1.75	0.50
6	Proficient	MS & OS	1.25	0.50

Table 4.14

Summary: Three-Way Analysis of Variance - Inappropriate Predictions

Stories	* Source	F-Ratio	Probability	Decision
DA & LL	A	2.01	.1687	N.S.
	B	.37	.5487	N.S.
	AB	6.95	.0145	Sig.
	C	3.33	.0806	N.S.
	BC	.37	.5488	N.S.
	AC	.37	.5488	N.S.
	ABC	1.03	.3209	N.S.
MS & OS	A	0.00	1.0000	N.S.
	B	.26	.6142	N.S.
	AB	.26	.6142	N.S.
	C	16.69	.0004	Sig.
	BC	.26	.6142	N.S.
	AC	0.00	1.0000	N.S.
	ABC	.26	.6142	N.S.

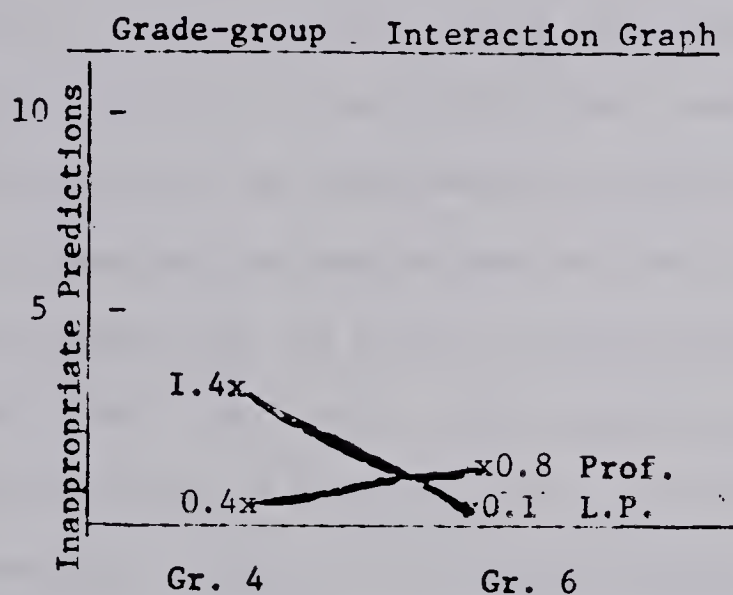
* A - Grade

B - Group

C - Treatment

Figure 4.3

Significant Interactions Graphs: Variable Four -
Number of Inappropriate Predictions



There were no significant interaction effects on this variable in MS & OS.

Table 4.15

Significant Interactions Revealed in DA & LL on Variable Four:
Number of Inappropriate Predictions and Results of
Scheffé Tests

Significant Interactions	Scheffé Test
Grade-group Interaction	N.S.

($p < .01$) for the stories DA & LL. The Scheffé test was unable to isolate a significant source of the interaction; however the Table of Means (4.13) shows that the largest number of inappropriate predictions was given by less proficient grade four subjects when probed.

When coefficients of correlation were computed (Tables 4.4-4.7), it was found that the relationship, generally negative, between the number of inappropriate predictions and the scores on the comprehension tests reached the .05 level of significance for the grade four subjects when probed (Table 4.4). This negative relationship appeared also when the scores on IN predictions were compared with the scores on the comprehension subtest of the Canadian Tests of Basic Skills. This too reached the level of significance ($p < .01$) only for probed grade four subjects (Table 4.4). The significance of the negative relationship which was revealed between predicting inappropriately and comprehending what was read should be emphasized. It would appear that there is support for the assumption that the role of prediction in reading is crucial. Subjects who predicted inappropriately appeared to be characterized by low comprehension scores not only on the stories in which they made the IN predictions but on comprehension tests generally, as shown by their scores on the comprehension subtest of the C.T.B.S. The need for further exploration of this relationship between prediction and comprehension is clearly indicated.

Because the difference in the number of inappropriate predictions due to grade and group was not significant, and the difference due to treatment was significant in only one set of stories (MS & OS), hypotheses 4.1, 4.2 and 4.3 were not rejected.

Applicative Level Responses

Since the types of supporting evidence will be discussed as proportions in Chapter V, only the scores on the total number of supported responses were submitted for statistical analysis. It should be remembered that subjects did not make an equal number of responses initially. Supporting evidence can be considered only in relation to the total number of responses that each group made. This will be reported in Chapter V along with the proportions of the various types of supporting evidence, and should be kept in mind when considering differences in the number of supported statements, as well as differences in the levels of thought presented in the following section.

Dependent Variable Five: Number of Supported Responses

The number of responses for which the subject offered support obviously was influenced by the nature of the interpretive level response he had made. For example, if the subject merely repeated what he had read in the previous sentence, no support was necessary.

Table 4.16 shows the mean number of supported responses made in each of the groups. The differences revealed by the analysis of variance are summarized in Table 4.17 in which A, B and C represent grade, group and treatment respectively. There was no significant difference in the number of supported responses made due to grade in either set of stories. Grade six, however, supported more responses than did the grade four subjects. There was a significant difference in the number of supported responses made due to group ($p < .01$) in MS & OS (Table 4.17). Proficient readers supported more responses

Table 4.16

Mean Number of Supported Responses

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	8.25	4.75
4	Proficient	DA & LL	6.50	3.50
6	Less Proficient	DA & LL	8.00	4.00
6	Proficient	DA & LL	7.25	8.25
4	Less Proficient	MS & OS	7.25	4.50
4	Proficient	MS & OS	6.75	9.75
6	Less Proficient	MS & OS	6.50	5.50
6	Proficient	MS & OS	6.50	8.50

Table 4.17

Summary: Three-Way Analysis of Variance - Supported Responses

Stories	* Source	F-Ratio	Probability	Decision
DA & LL	A	1.79	.1922	N.S.
	B	.02	.8827	N.S.
	AB	3.76	.0645	N.S.
	C	8.02	.0092	Sig.
	BC	2.69	.1141	N.S.
	AC	1.09	.3071	N.S.
	ABC	1.79	.1923	N.S.
MS & OS	A	.17	.6824	N.S.
	B	6.59	.0169	Sig.
	AB	.34	.5673	N.S.
	C	.17	.6824	N.S.
	BC	8.41	.0079	Sig.
	AC	6.18	.8058	N.S.
	ABC	.83	.3712	N.S.

* A - Grade

B - Group

C - Treatment

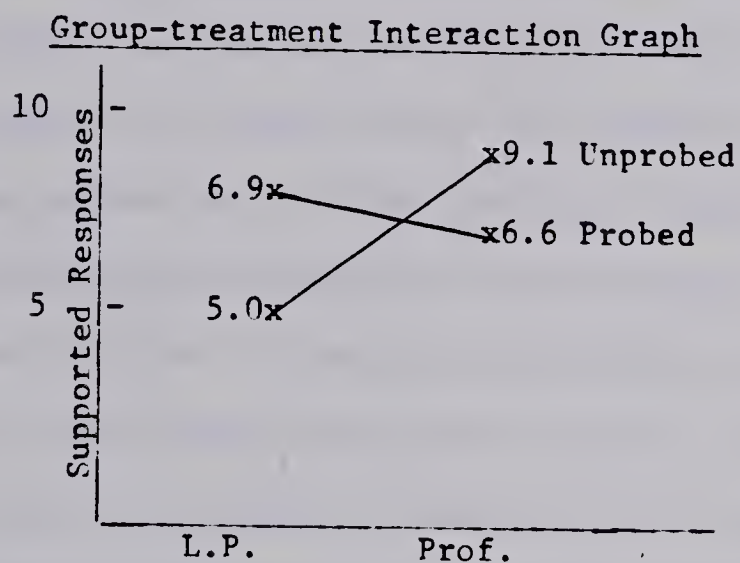
than did the less proficient. The difference is wider than Table 4.16 suggests when one considers the fact that the latter made more responses than the former (see Tables 5.6 and 5.7 in Chapter V).

In DA & LL there were significant effects due to treatment ($p < .009$). The differences favoured the probed condition. Strangely, in MS & OS the treatment differences favoured the unprobed condition. The group-treatment interaction graph (Figure 4.4) shows that in MS & OS proficient readers supported more responses when reading independently whereas the less proficient readers supported more responses when probed. The difference was not sufficiently wide for the Scheffé test to isolate the significant source of the interaction although the Table of Means (4.16) indicates that the greatest difference was between the unprobed scores of the less proficient and proficient readers.

A positive relationship (Tables 4.4-4.7) between supported responses and convergent productions reached the .05 and .01 level of significance for grade four and grade six subjects respectively when reading with probing (Tables 4.4 and 4.6). The relationship was positive but not significant in the unprobed condition (Tables 4.5 and 4.7). The positive relationship between supported responses and divergent productions (DP) reached the .01 level of significance when subjects of both grades read independently (Tables 4.5 and 4.7). The significant positive relationship between supported responses and divergent productions in the unprobed condition and the negative relationship between these same two variables in the probed condition is accounted for by the fact that in the unprobed condition the majority

Figure 4.4

Significant Interactions Graphs: Variable Five -
Number of Supported Responses



There were no significant interaction effects on this variable in DA & LL.

Table 4.18

Significant Interactions Revealed in MS & OS on Variable Five:
Number of Supported Responses and Results of
Scheffé Tests

Significant Interactions	Scheffé Test
Group-treatment Interaction	N.S.

of the divergent productions was given by the proficient readers, who tend also to offer supporting evidence. In the probed condition since divergent responses were elicited and since less proficient readers, who tend to offer less support, had a higher number of responses than proficient readers, the relationship was, therefore, negative. Without the probe the pattern was for less proficient readers to score high on cognitive memory productions and for the proficient to have high scores in the DP column. A positive relationship, significant at the .05 level, was found between supported responses and evaluative productions for grade four subjects when these were probed (Table 4.4).

Because the difference in the number of supported responses due to grade was not significant, hypothesis 5.1 was not rejected. Since the difference due to group was significant in only one set of stories (MS & OS) and the difference due to treatment was significant only in DA & LL, hypotheses 5.2 and 5.3 were not rejected.

Levels of Thought

The study has emphasized reading as reasoning and has been concerned with the cognitive processes involved in prediction. The number of responses assigned to each of the five levels of thought was submitted for analysis to determine whether these would differentiate between proficient and less proficient readers in grades four and six.

Dependent Variable Six: Number of Cognitive Memory Productions

Many subjects in the sample appeared to be preoccupied with the recitation of the details of the story. The purpose for reading

which these subjects seemed to set was that of proving to the investigator that they knew what the story was about. This resulted in large numbers of cognitive memory productions for some readers.

Table 4.19 shows the mean number of cognitive memory productions given in each of the groups. It can be seen that there are higher scores in the unprobed than in the probed column. The differences revealed by the analysis of variance are summarized in Table 4.20 in which grade, group and treatment are represented by A, B and C respectively. There was no significant difference due to grade in the number of cognitive memory productions given. In both sets of stories differences which existed favoured the sixth graders. There were no significant effects due to group; however in MS & OS the differences were approaching significance ($p < .053$). Table 4.19 shows that in all cases less proficient readers had higher scores than the proficient. In all stories there were significant effects due to treatment (DA & LL: $p < .04$; MS & OS: $p < .003$), with CM responses being far more numerous in the unprobed condition.

When coefficients of correlation were computed (Tables 4.4-4.7) a positive relationship, significant at the .01 level for grade four and at the .05 level for grade six, was revealed between CM productions and convergent productions when subjects were probed (Tables 4.4 and 4.6). The relationship between these two variables was negative but not significant in the unprobed condition (Tables 4.5 and 4.7). This negative relationship reflects the tendency toward restatement of facts when reading independently, thus causing convergent productions to decrease as subjects gave more attention to retelling the stories.

Table 4.19

Mean Number of Cognitive Memory Productions

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	1.25	4.00
4	Proficient	DA & LL	0.75	3.00
6	Less Proficient	DA & LL	1.00	9.50
6	Proficient	DA & LL	0.25	2.75
4	Less Proficient	MS & OS	0.25	6.50
4	Proficient	MS & OS	0.00	3.50
6	Less Proficient	MS & OS	0.25	10.25
6	Proficient	MS & OS	0.00	1.00

There were no significant interaction effects on this variable in any of the stories. Therefore, no Scheffé tests were indicated.

Table 4.20

Summary: Three-Way Analysis of Variance -
Cognitive Memory Productions

Stories	Source	F-Ratio	Probability	Decision
DA & LL	A	.37	.5497	N.S.
	B	1.47	.2367	N.S.
	AB	.65	.4264	N.S.
	C	4.65	.0412	Sig.
	BC	.77	.3895	N.S.
	AC	.65	.4264	N.S.
	ABC	.55	.4655	N.S.
MS & OS	A	.04	.8441	N.S.
	B	4.11	.0538	N.S.
	AB	.99	.3301	N.S.
	C	10.89	.0030	Sig.
	BC	3.49	.0739	N.S.
	AC	.04	.8441	N.S.
	ABC	.99	.3301	N.S.

Similarly, CM productions related negatively to DP responses, significantly ($p < .001$ and $p < .05$) in the probed condition (Tables 4.4 and 4.6).

Because the difference in the number of CM productions due to grade and group was not significant, hypotheses 6.1 and 6.2 were not rejected. Since in all stories, there was a significant difference due to treatment, hypothesis 6.3 was rejected.

Dependent Variable Seven: Number of
Convergent Productions

The pattern of results from this analysis was similar to that of the previous one for CM productions. Table 4.21 shows the mean number of convergent productions given in each of the groups. It is interesting to note that for DA & LL mean scores are higher in the probed column; whereas for MS & OS they are higher in the unprobed column. The differences revealed by the analysis of variance are summarized in Table 4.22 in which grade, group and treatment are represented by A, B and C respectively. There were no significant effects due to grade on the number of CP responses given in either set of stories. Grade four subjects had higher scores in DA & LL, whereas in MS & OS the differences favoured the sixth graders. There was no significant difference due to group in either set of stories. The less proficient readers made more CP responses than did the proficient. There were significant effects due to treatment (DA & LL: $p < .01$; MS & OS: $p < .00$). Table 4.21 shows that in DA & LL the differences favoured the probed treatment, whereas in MS & OS the differences favoured the unprobed condition. The nature of the stories and of the

Table 4.21

Mean Number of Convergent Productions

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	4.75	3.50
4	Proficient	DA & LL	3.00	1.25
6	Less Proficient	DA & LL	4.50	1.50
6	Proficient	DA & LL	3.25	2.75
4	Less Proficient	MS & OS	1.25	4.25
4	Proficient	MS & OS	1.00	2.25
6	Less Proficient	MS & OS	1.00	4.50
6	Proficient	MS & OS	1.00	4.50

There were no significant interaction effects on this variable in any of the stories. Therefore, no Scheffé tests were indicated.

Table 4.22

Summary: Three-Way Analysis of Variance - Convergent Productions

Stories	* Source	F-Ratio	Probability	Decision
DA & LL	A	.04	.8481	N.S.
	B	2.39	.1344	N.S.
	AB	2.39	.1344	N.S.
	C	6.34	.0189	Sig.
	BC	.59	.4462	N.S.
	AC	.04	.8481	N.S.
	ABC	1.35	.2567	N.S.
MS & OS	A	.63	.4347	N.S.
	B	.63	.4347	N.S.
	AB	.63	.4347	N.S.
	C	15.78	.0006	Sig.
	BC	.38	.5425	N.S.
	AC	.94	.3412	N.S.
	ABC	.38	.5425	N.S.

* A - Grade

B - Group

C - Treatment

probe (to be discussed later) appeared to be playing a significant role.

One story, DA, resulted in a large number of guesses as to the identity of the animal in the probed condition. In MS & OS subjects were structured in the direction of divergent thinking when probed, thus decreasing the number of convergent productions. The implications from these results concerning the role of pre-questioning and purpose setting are obvious and will be discussed in Chapter VI.

Tables 4.4 and 4.6 show that there was a negative relationship, significant ($p < .001$) in the probed condition, between CP responses and DP responses, once again reflecting the nature of the probe that was given. A significant ($p < .01$) positive relationship was found for probed grade four subjects between CP and EP responses (Table 4.4). However, no groups had high scores in the EP column.

Because the difference in the number of CP responses due to grade and group was not significant, hypotheses 7.1 and 7.2 were not rejected. Since the effects due to treatment were significant in all stories, hypothesis 7.3 was rejected. The results of this analysis revealed not only the influence of the nature of the story on the predictive process but also the importance of the nature of the probe.

Dependent Variable Eight: Number of Divergent Productions

Table 4.23 shows the mean number of divergent productions given in each of the groups. Generally scores on this variable are higher in the probed than in the unprobed column. The differences revealed by the analysis of variance are summarized in Table 4.24 in which grade,

Table 4.23

Mean Number of Divergent Productions

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	2.50	1.25
4	Proficient	DA & LL	3.75	2.25
6	Less Proficient	DA & LL	2.75	1.00
6	Proficient	DA & LL	3.75	5.25
4	Less Proficient	MS & OS	6.50	1.00
4	Proficient	MS & OS	6.50	5.75
6	Less Proficient	MS & OS	5.00	1.50
6	Proficient	MS & OS	7.00	4.75

Table 4.24

Summary: Three-Way Analysis of Variance - Divergent Productions

Stories	*Source	F. Ratio	Probability	Decision
DA & LL	A	2.88	.1026	N.S.
	B	17.99	.0003	Sig.
	AB	2.88	.1026	N.S.
	C	2.88	.1026	N.S.
	BC	2.88	.1026	N.S.
	AC	1.99	.1702	N.S.
	ABC	3.92	.0593	N.S.
MS & OS	A	.28	.6017	N.S.
	B	12.44	.0017	Sig.
	AB	.03	.8615	N.S.
	C	17.90	.0003	Sig.
	BC	4.48	.0449	Sig.
	AC	.03	.8615	N.S.
	ABC	1.52	.2291	N.S.

* A - Grade

B - Group

C - Treatment

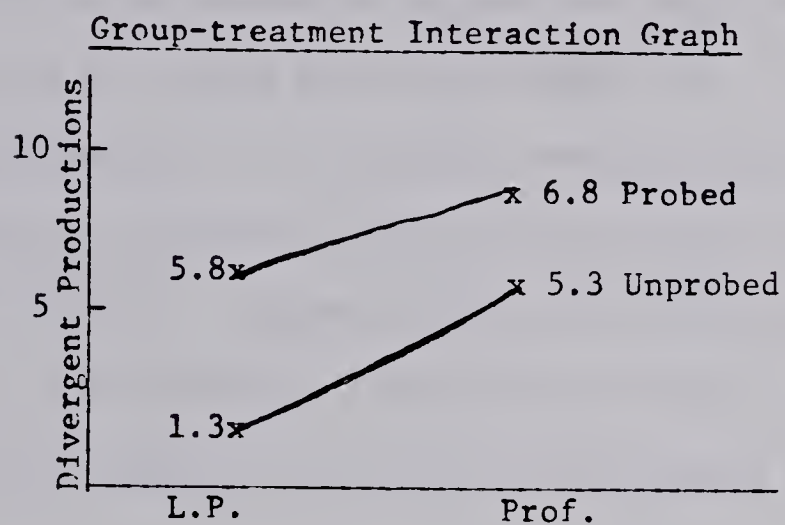
group and treatment are represented by A, B and C respectively. There was no significant difference due to grade in the number of DP responses given. In DA & LL the sixth graders out-scored the grade four subjects, whereas in MS & OS the reverse was true. In all stories there were significant effects due to group (DA & LL: $p < .00$; MS & OS: $p < .001$), the differences favouring the proficient readers in each grade. In MS & OS there were significant effects due to treatment ($p < .00$) favouring the probed condition. Although differences due to treatment were not significant in DA & LL, more DP responses were given in the probed than in the unprobed condition.

The analysis showed that not all subjects who are capable of divergent thinking are inclined to operate on this level when reading independently. It can be seen from Table 4.23 that in DA & LL the number of DP responses was greater in the probed than in the unprobed condition for all groups except proficient sixth graders. This suggests that when reading independently, the proficient readers in grade six are more inclined toward divergent thinking than are the other groups. When the scores of proficient fourth graders are compared on the two sets of stories, it appears that these readers were influenced in the direction of divergent thinking by the stories MS & OS.

Figure 4.5 graphs the significant group-treatment interaction effect ($p < .04$) which was revealed by the analysis of MS & OS. Although the Scheffé test was unable to isolate a significant source of the interaction, the means show that the greatest variation was between the scores of the proficient readers when probed and those of the less proficient when reading without probing. It can be seen also

Figure 4.5

Significant Interactions Graphs: Variable Eight -
Number of Divergent Productions



There were no significant interaction effects on this variable in DA & LL.

Table 4.25

Significant Interactions Revealed in MS & OS on Variable Eight:
Number of Divergent Productions and Results of
Scheffé Tests

Significant Interactions	Scheffé Test
Group-treatment Interaction	N.S.

that probing had the greatest effect on the responses of less proficient readers.

Tables 4.4-4.7 indicate a negative relationship between divergent productions and evaluative productions which was significant ($p < .05$) only for probed grade four subjects ($r = .62$).

Since neither set of stories revealed a significant difference in the number of divergent productions given due to grade, hypothesis 8.1 was not rejected. Because effects due to group were significant hypothesis 8.2 was rejected. The difference due to treatment was significant only in MS & OS; therefore, hypothesis 8.3 was upheld.

Dependent Variable Nine: Number of
Evaluative Productions

Evaluative productions were responses dealing with a judgement or a choice. The mean number of evaluative productions given in each of the groups is presented in Table 4.26. The differences revealed by the analysis of variance are summarized in Table 4.27 in which grade, group and treatment are represented by A, B and C respectively. A significant difference in the number of evaluative productions made due to grade was revealed in MS & OS ($p < .04$), with grade four subjects scoring higher than the sixth graders. In DA & LL the latter scored higher but not significantly so. There was a significant difference in the number of EP responses due to group revealed in MS & OS, the less proficient readers scored higher than the proficient. Differences, although not significant, were in the same direction in DA & LL. In both sets of stories there were significant effects due to treatment (DA & LL: $p < .02$; MS & OS: $p < .001$) favouring the unprobed condition.

Table 4.26

Mean Number of Evaluative Productions

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	2.50	0.50
4	Proficient	DA & LL	0.00	2.50
6	Less Proficient	DA & LL	5.00	1.50
6	Proficient	DA & LL	0.00	1.75
4	Less Proficient	MS & OS	0.00	3.75
4	Proficient	MS & OS	0.00	1.00
6	Less Proficient	MS & OS	1.00	0.50
6	Proficient	MS & OS	0.00	0.50

Table 4.27

Summary: Three-Way Analysis of Variance - Evaluative Productions

Stories	* Source	F-Ratio	Probability	Decision
DA & LL	A	.04	.8348	N.S.
	B	.39	.5331	N.S.
	AB	.71	.4074	N.S.
	C	5.38	.0292	Sig.
	BC	1.60	.2181	N.S.
	AC	0.00	1.0000	N.S.
	ABC	.39	.5330	N.S.
MS & OS	A	4.37	.0472	Sig.
	B	8.13	.0088	Sig.
	AB	1.77	.1958	N.S.
	C	13.05	.0014	Sig.
	BC	1.77	.1958	N.S.
	AC	13.05	.0014	Sig.
	ABC	8.13	.0088	Sig.

* A - Grade

B - Group

C - Treatment

Figure 4.6 graphs the grade-treatment interaction which was revealed in MS & OS and shows that the grade four subjects were affected by probing to a greater extent than were the sixth graders. The fourth graders made their highest scores in the EP column when they read without probing. Although the greatest differences existed between the probed and unprobed scores of grade four subjects, the Scheffé test did not isolate a significant source of the interaction. However, when the grade-group-treatment interaction effects were considered, the Scheffé test did find the unprobed scores of the less proficient fourth graders to be significantly higher than those of all other groups. Since the number of evaluative productions made was small and since some groups made none at all, conclusions based on this analysis must be extremely tentative.

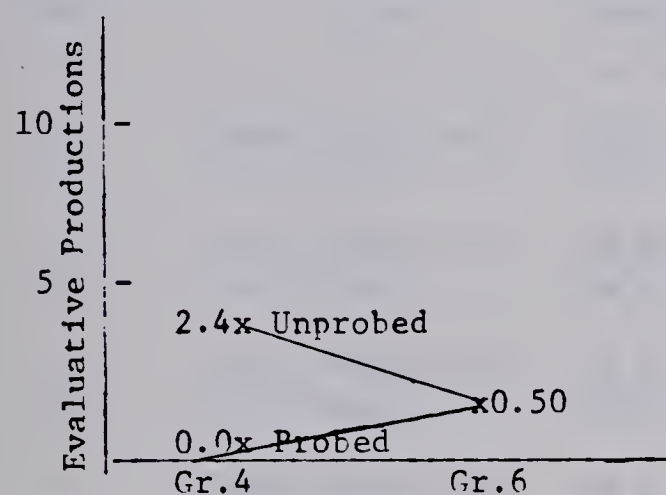
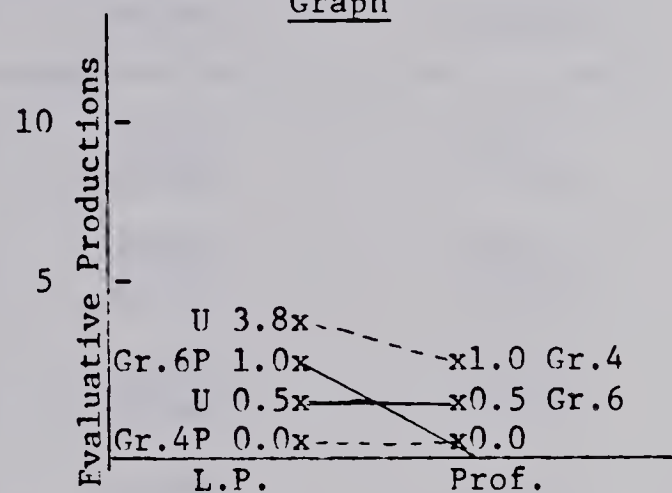
Since a significant difference in the number of evaluative productions due to grade and group was found in only one set of stories (MS & OS), hypotheses 9.1 and 9.2 were not rejected. Because there were significant effects due to treatment in both DA & LL ($p < .02$) and MS & OS ($p < .001$), hypothesis 9.3 was rejected.

Dependent Variable Ten: Comprehension
of Stories

After reading each story the subjects were given a test of comprehension based on the selection. The mean scores are presented in Table 4.29 and the results of the analysis of variance are summarized in Table 4.30 in which grade, group and treatment are represented by A, B and C respectively. A significant difference in comprehension due to grade was found in DA & LL ($p < .003$), the difference favouring the

Figure 4.6

Significant Interactions Graphs: Variable Nine -
Number of Evaluative Productions

Grade-treatment Interaction GraphGrade-group-treatment Interaction Graph

There were no significant interaction effects on this variable in DA & LL.

Table 4.28

Significant Interactions Revealed in MS & OS on Variable Nine:
Number of Evaluative Productions and Results of
Scheffé Tests

Significant Interactions	Scheffé Test
Grade-treatment Interaction	N.S.
Grade-group-treatment Interaction	*Sig.

*Scheffé Test of Significance Between Groups

	4LP-P	4LP-U	4Prof-P	4Prof-U	6LP-P	6LP-U	6Prof-P	6Prof-U
4LP-P								
4LP-U	*		*	*	*	*	*	*
4Prof-P								
4Prof-U								
6LP-P								
6LP-U								
6Prof-P								
6Prof-U								

Table 4.29

Mean Comprehension *Scores on Stories

Grade	Group	Stories	Probed	Unprobed
4	Less Proficient	DA & LL	13.00	12.75
4	Proficient	DA & LL	17.00	17.00
6	Less Proficient	DA & LL	18.00	14.50
6	Proficient	DA & LL	17.25	18.50
4	Less Proficient	MS & OS	13.75	13.00
4	Proficient	MS & OS	17.00	17.75
6	Less Proficient	MS & OS	15.00	15.50
6	Proficient	MS & OS	16.50	16.75

* Out of 20

Table 4.30

Summary: Three-Way Analysis of Variance - Comprehension Scores on Stories

Stories	*Source	F-Ratio	Probability	Decision
DA & LL	A	10.90	.0030	Sig.
	B	19.95	.0002	Sig.
	AB	3.77	.0639	N.S.
	C	.94	.3412	N.S.
	BC	3.77	.0639	N.S.
	AC	.60	.4448	N.S.
	ABC	3.06	.0933	N.S.
MS & OS	A	.84	.3684	N.S.
	B	19.19	.0002	Sig.
	AB	4.58	.0428	Sig.
	C	.09	.7625	N.S.
	BC	.26	.6152	N.S.
	AC	.09	.7625	N.S.
	ABC	.51	.4827	N.S.

* A - Grade

B - Group

C - Treatment

grade six subjects. There was a significant difference due to group in both sets of stories (DA & LL: $p < .00$; MS & OS: $p < .00$). The proficient readers made higher scores than did the less proficient readers. There were no significant effects due to treatment in either set of the stories. Significant grade-group interaction effects which were found in MS & OS are represented by the graph in Figure 4.7. Although the Scheffé test did not isolate the significance source of interaction, it can be seen that the widest difference in comprehension scores was between the proficient and less proficient readers at the grade four level.

There was a positive relationship (Table 4.5) between the comprehension scores and evaluative productions, reaching the .05 level of significance for grade four subjects reading without the probe ($r = .53$). As suggested earlier, it may be that there was not sufficient variation in the comprehension scores to cause some of the relationships which were indicated to reach the level of significance.

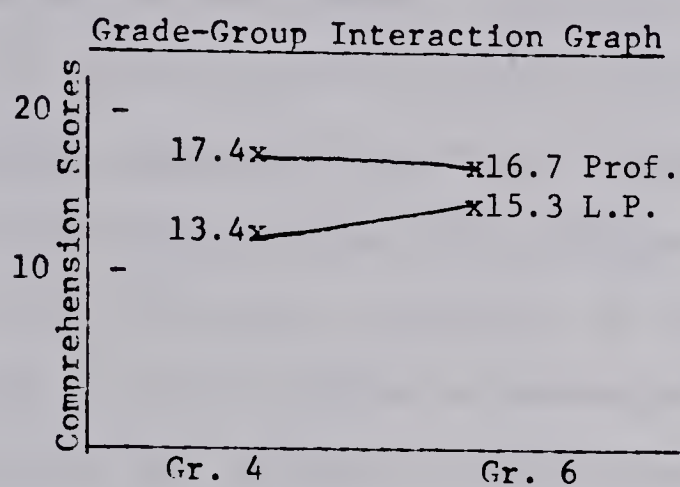
Since a significant difference in comprehension scores due to grade was found in only one set of stories (DA & LL), hypothesis 10.1 was not rejected. A significant difference due to group, however, was revealed in both sets of stories; therefore hypothesis 10.2 was rejected. Hypothesis 10.3 was upheld since the difference in comprehension due to treatment was not significant in any of the stories.

Relationship: Standardized Tests and Ten Dependent Variables

Coefficients of correlation were computed among the standardized reading and intelligence test scores and the ten dependent variables

Figure 4.7

Significant Interactions Graphs: Variable Ten -
Comprehension Scores on Stories Read



There were no significant interaction effects on this variable in DA & LL.

Table 4.31

Significant Interactions Revealed in MS & OS on Variable Ten:
Comprehension Scores on Stories Read and Results
of Scheffé Tests

Significant Interactions	Scheffé Test
Grade-group Interaction	N.S.

used in the analysis (Tables 4.4-4.7). This section discusses the significant relationships that were found. These significant relationships are summarized in Tables 4.32-4.35.

For subjects of both grades a significant positive relationship ($p < .05$ and $p < .01$) was revealed between intelligence test scores on the Peabody Picture Vocabulary Test and the vocabulary and comprehension scores on the Canadian Tests of Basic Skills. There was a positive relationship ($p < .05$) between intelligence and comprehension of the stories. Similar ($p < .05$) positive relationships were revealed between intelligence and the number of predictions, as well as the number of appropriate predictions made. The significant negative relationship ($p < .001$) between intelligence and the number of supported responses given by probed grade four subjects is accounted for by the fact that fewer responses were made by high intelligence subjects than by those who made lower scores on the intelligence test.

A significant positive relationship ($p < .001$) was revealed between the scores on the vocabulary and comprehension subtests of the Canadian Tests of Basic Skills. In the unprobed condition, comprehension of the stories was related positively ($p < .01$) to the vocabulary scores in both grades. In the probed condition, this relationship was significant only in grade four ($p < .001$). For grade six subjects there was a significant positive relationship ($p < .05$) between vocabulary scores and the number of divergent productions when no probe was given. Significant negative relationships ($p < .05$) were found between vocabulary scores and total supported responses (grade four probed), between vocabulary scores and evaluative productions (grade

Table 4.32

Summary: Variables For Which Significant Correlations Were Revealed For Grade Four Subjects Probed

Variable	I	2	3	4	5	6	7	8	9	10	11	12	13
1. I.Q.		.719**	.662**										
2. Vocabulary (CTBS)			.874***										
3. Comprehension (CTBS)													
4. Number of Predictions													
5. Appropriate Predictions													
6. Plausible Predictions													
7. Inappropriate Predictions													
8. Total Supported Responses													
9. Comprehension of Stories													
10. Cognitive Memory Productions													
11. Convergent Productions													
12. Divergent Productions													
13. Evaluative Productions													

* p < .05 ** p < .01 *** p < .001

Table 4.33

Summary: Variables For Which Significant Correlations Were Revealed For Grade Four Subjects Unprobed

Variable	I	2	3	4	5	6	7	8	9	10	11	12	13
I. I.Q.													
2. Vocabulary (CTBS)		.719**	.662**						.502*				
3. Comprehension (CTBS)			.874***						.795**			.536*	
4. Number of Predictions									.819***		-.593*		
5. Appropriate Predictions					.969***			.754***				.903***	
6. Plausible Predictions								.702**				.918**	
7. Inappropriate Predictions													
8. Total Supported Responses												.695**	
9. Comprehension of Stories													.171*
10. Cognitive Memory Productions													
II. Convergent Productions													
12. Divergent Productions													
14. Evaluative Productions													

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 4.34

Summary: Variables For Which Significant Correlations Were Revealed For Grade Six Subjects Probed

Variable	I	2	3	4	5	6	7	8	9	10	11	12	13
1. I.Q.		.720**	.522*	.592*	.603*								
2. Vocabulary (CTBS)			.869***		.538*								-.515*
3. Comprehension (CTBS)					.570*								-.555
4. Number of Predictions					.926***							.544*	
5. Appropriate Predictions													
6. Plausible Predictions													
7. Inappropriate Predictions													
8. Total Supported Responses											.710**		
9. Comprehension of Stories													
10. Cognitive Memory Productions													
11. Convergent Productions											.574*	-.507*	
12. Divergent Productions											.	-.755***	
13. Evaluative Productions													

* p < .05

** p < .01

*** p < .001

Table 4.35

Summary: Variables For Which Significant Correlations Were Revealed For Grade Six Subjects Unprobed

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
I. I.Q.		.720**	.522*						.599*				
2. Vocabulary (CTBS)			.869***	.631**	.622**				.645**	-.543*		.584*	
3. Comprehension (CTBS)				.670**	.648**			.557*	.624**			.619**	
4. Number of Predictions					.992***			.657**		-.514*		.899***	
5. Appropriate Predictions								.639**		-.500*		.882***	
6. Plausible Predictions													
7. Inappropriate Predictions													
8. Total Supported Responses												.618**	
9. Comprehension of Stories													
10. Cognitive Memory Productions													
II. Convergent Productions													
12. Divergent Productions													
13. Evaluative Productions													

* p < .05

** p < .01

*** p < .001

six probed), and between vocabulary scores and cognitive memory productions (grade six unprobed).

Significant positive relationships ($p < .001$ and $p < .01$) were revealed between comprehension scores on the Canadian Tests of Basic Skills and the comprehension scores on the stories. Comprehension (C.T.B.S.) related positively ($p < .01$) to the number of predictions, the number of appropriate predictions, total support and the number of divergent productions given by grade six subjects when reading independently. Significant negative relationships ($p < .01$ and $p < .05$) were revealed between the comprehension scores (C.T.B.S) and inappropriate predictions (grade four probed), evaluative productions (grade six probed), and convergent productions (grade four unprobed). Intelligence, comprehension, supporting responses, divergent thinking and prediction in reading appear to be closely related.

Differences Revealed by the Analyses

Table 4.36 summarizes the significant differences which were revealed by the two three-way analyses of variance. Some variations in findings depending upon the stories considered can be noted. However, generally the findings indicate that it was proficiency level and probing that accounted for most of the significant differences. Although few significant differences due to grade were revealed in the analyses, the evidence suggests that prediction in reading is developmental, even though the differences between the two grades in this sample did not always reach the level of significance.

Table 4.36

Variables for which Significant Differences Were Revealed
by the Three-way Analyses of Variance

Variable	DA & LL		MS & OS	
	Grade Group Treatment		Grade Group Treatment	
Number of Predictions	x	x	x	x
Appropriate Predictions	x	x	x	
Plausible but Unlikely Predictions				
Inappropriate Predictions				x
Total Support		x	x	
Cognitive Memory Productions		x		x
Convergent Productions		x		x
Divergent Productions	x		x	x
Evaluative Productions		x	x	x
Comprehension of Stories	x	x	x	

Summary

The findings of the statistical analysis reported in this chapter reveal differences in the predictive process due to grade, group and treatment and isolate some of the variables which were able to discriminate significantly among subjects.

Consideration of the first four variables, the number and kinds of predictions made, showed that although differences in the number of predictions made by proficient and less proficient readers when probed were not extreme, when subjects read without probing these differences were significant. Proficient readers made more predictions than did the less proficient and all readers predicted more often when probed. Two less proficient readers made no predictions at all when reading independently. Differences between the grades in the number and kinds of predictions were not significant. Proficient readers were found to predict more appropriately than did the less proficient readers and all subjects made more inappropriate predictions in the probed condition.

An examination of variable five, supporting evidence given, showed that although less proficient readers made more responses, proficient readers generally supported a greater proportion of their responses. In some of the stories a significantly larger number of responses was supported in the probed than in the unprobed condition.

When variables six to nine, the levels of thinking, were considered it was found that for most stories it was probing that differentiated among the groups and that the less proficient readers were influenced to a greater extent by the treatment than were the proficient. Without the probe the former tended to retell the story, whereas the

latter, particularly those in grade six, made many divergent responses. Considerable within-group variance was noted.

No significant differences in comprehension scores due to treatment were revealed. Mostly, it was reading proficiency level that discriminated among subjects when comprehension scores were compared. Significant differences due to grade did appear in one set of stories.

The stated hypothesis that intelligence, comprehension, divergent thinking, the ability to support responses and prediction in reading are intricately related is confirmed by the results of the analyses.

CHAPTER V

FINDINGS: QUALITATIVE ANALYSIS OF THE DATA

This chapter reports the findings from the qualitative analysis of the data which were classified according to the framework described in Chapter III. The findings presented will be supported by calculations based on percentages derived as indicated in that chapter and by reference to individual protocols. Reference will be made also to some of the significant differences which were revealed by the statistical analysis discussed in Chapter IV.

Number of Predictions

The responses of the subjects to the question, "What do you think will happen next?" and to the assignment of telling all that they thought as they read were examined and the number of predictions calculated for each reader. Table 5.1 gives the number of predictions made by the subjects in each group in both the probed and unprobed conditions. In all groups more predictions were made when the probe was presented. When subjects were probed an equal number of predictions was given from grades four and six. In grade four there was little difference in the number given by the two groups (Less Proficient (L.P.) - 73; Proficient (Prof.) - 70). However, in grade six there was a greater difference between the groups (L.P. - 59; Prof. - 84).

Table 5.1
Number of Predictions

Subjects	Grade	Group	Predictions		Mean		Predictions		Mean		Total	Differences Between Probed and Unprobed Score	
			Probed	Unprobed	Probed	Unprobed	Probed	Unprobed	Probed	Unprobed			
8	4	Less Proficient	73	25	9.125	3.125	98				98		48
8	4	Proficient	70	53	8.750	6.625	123				123		17
8	6	Less Proficient	59	23	7.375	2.875	82				82		36
8	6	Proficient	84	76	10.500	9.500	160				160		8

Without the benefit of the probe the decrease in the number of predictions was significant. A wide discrepancy can be noted between the grades (Gr. 4 - 78; Gr. 6 - 99). In grade four the less proficient, who made a slightly higher number of predictions than did the proficient readers when probed, gave less than half as many as those given by their proficient counterparts in the unprobed condition (L.P. - 25; Prof. - 53). The number of predictions given by proficient fourth graders decreased significantly from their probed score (70). There is a striking difference between the scores of the two grade six groups (L.P. - 23; Prof. - 76). Whereas the scores of the less proficient sixth graders decreased from 59 to 23 when no probe was given, they did not diminish to any great extent for proficient readers (84 to 76). The importance of this finding should be emphasized. The tendency for proficient readers to predict with similar frequency whether probed or unprobed reveals an ability in these readers to set up their own purposes when reading independently. The difference between the grades suggests that this ability is developmental.

An examination of individual protocols showed that there were two subjects, one in each grade, who made no predictions at all when reading without probing. One of these subjects was male and the other female. This is an important finding since it contradicts, or at least questions, Smith's claim that all children predict when reading. It raises the possibility that some children may not predict ideationally when reading independently.

It is somewhat alarming to find that whether probed or not, the less proficient readers in grade six gave fewer predictions than did their less proficient counterparts in grade four. An examination of individual responses indicated that at the grade six level there was an increasing concern with the recitation of the facts of the story. Whether this is indicative of levels of thinking or of the subject's perception of the teacher's expectations is, indeed, a matter of conjecture. Some stories elicited more predictions than others. It is difficult to determine whether this fact resulted from the influence of the structural features or the content of the story, possibly a combination of the two factors. This matter will be discussed at length after the scores on other variables have been considered.

Often embedded in a single response from some readers was a whole series of predictions. Subjects would tell, for example, not only what the Indians would do but also what Nancy and Grandmother would do in response to the action of the Indians. Others would predict a series of actions of a single character. These series predictions were more numerous in the responses of proficient readers, with the sixth graders having the largest number (Gr. 4 L.P. - 8; Gr. 4 Prof. - 13; Gr. 6 L.P. - 5; Gr. 6 Prof. - 32. See Appendix F.).

In summary, Table 5.1 shows that whether they were reading in a structured situation or reading independently, proficient

readers in grades four and six made predictions. Two of the less proficient readers, however, made no predictions when reading without the probe. That these readers can predict was shown in the probed condition. The question as to whether or not they do predict requires further exploration. The suggestion is that they may not. The extent to which subjects made predictions varied according to the grade and proficiency level of the readers and to the degree of structure that was provided. The structure and content of the stories appeared to be factors influencing prediction. The data support the conclusion that proficient readers make more predictions than do the less proficient subjects when reading independently. The fact that the proficient sixth graders predicted almost as frequently when reading independently as they did when probed, suggests that the skill is developmental and provides evidence for the theory that the ability to deal in the realm of the possible and the probable is a characteristic of this developmental stage.

Kinds of Predictions

Not all predictions were of the same quality, some being more appropriate than others. The predictions given were categorized according to the classes defined in Chapter III. These classes included predictions which were appropriate and in accord with story events (AA), those which were appropriate but not in accord with story events (AN), those which were plausible but unlikely (PU) and inappropriate predic-

tions (IN). Table 5.2 presents the proportions of the total number of predictions in the probed condition that were assigned to each of the categories. It can be seen that when less proficient grade four subjects were probed 15.1% of the predictions they made were appropriate and in accord with story events (AA). Similarly, 54.8% of their predictions were in the AN category, 10.9% were PU and 19.2% were IN predictions. Table 5.3 classifies the unprobed predictions. It shows that when less proficient grade four subjects read without probing 28.0% of all predictions given were in the AA category. Similarly, 44.0% were AN, 8.0% were PU and 20.0% of their predictions were IN. The proportions are shown also for the readers of the other three proficiency levels.

Higher proportions of predictions were appropriate and in accord with the events of the story (AA) when the subjects read without probing. In the probed condition, greater percentages of the predictions of grade six subjects than of the fourth graders were AA predictions. The proficient readers of each grade out-scored the less proficient (Gr. 4 Prof. - 24.3%; Gr. 6 Prof. - 26.2%; Gr. 4 L.P. - 15.1%; Gr. 6 L.P. - 16.9%). That percentages of AA predictions were higher for all groups in the unprobed condition probably is due to the fact that subjects were free to respond when they were so inclined. They were not asked to tell what they thought would happen next. Grade six produced a greater proportion of AA predictions than did the grade four

Table 5.2

Proportion of Kinds of Predictions in Relation to the Total
Number of Predictions Made (Probed Treatment)

Grade	Group	*AA	AN	PU	IN
4	Less Proficient	15.1	54.8	10.9	19.2
4	Proficient	24.3	61.4	2.9	11.4
6	Less Proficient	16.9	61.0	8.5	13.6
6	Proficient	26.2	58.3	4.8	10.7

Table 5.3

Proportion of Kinds of Predictions in Relation to the Total
Number of Predictions Made (Unprobed Treatment)

Grade	Group	*AA	AN	PU	IN
4	Less Proficient	28.0	44.0	8.0	20.0
4	Proficient	32.0	58.5	3.8	5.7
6	Less Proficient	52.2	34.8	4.3	8.7
6	Proficient	34.2	60.5	-	5.3

*AA - Appropriate and in accord with story events.

AN - Appropriate but not in accord with story events.

PU - Plausible but unlikely.

IN - Inappropriate.

subjects and the less proficient sixth graders gave a higher proportion of AA predictions than did the proficient (L.P. - 52.2%; Prof. - 34.2%). It should be remembered that the less proficient readers in grade six had the lowest total number of predictions (23) of all the groups. In grade four the proficient readers gave the highest percentage of AA predictions. (Gr. 4 L.P. - 28.0%; Gr. 4 - Prof. - 32%).

Table 5.2 and Table 5.3 show that the proportions of predictions that were appropriate although not in accord with the events of the story (AN). It should be noted that the percentage of predictions in the AN category generally was lower in the unprobed than in the probed condition, except in the case of the proficient grade six readers. This is understandable considering the fact that subjects, when probed, may not have been ready to make a prediction. They felt that they must make some response because they were asked what they thought would happen next. Unprobed, they could wait for additional information before making a response. It is interesting to note that when subjects were probed the proportion of AN predictions increased in grade four as proficiency level increased (L.P. - 54.8%; Prof. - 61.4%), whereas the reverse was true in grade six (L.P. - 61.0%; Prof.-58.3%).

In the unprobed condition in both grades four and six, proportions of AN predictions increased as the proficiency level of the readers increased (Gr. 4 L.P. - 44.0%; Gr. 4 Prof. - 58.5%; Gr. 6 L.P. - 34.8%; Gr. 6 Prof. - 60.5%). The fact that proficient readers were more venturesome and offered many possible solutions helped to account for these trends.

As might be expected percentages of plausible but unlikely predictions (PU) were higher in the probed than in the unprobed condition, except for proficient readers in grade four, where differences were very slight. With or without the probe there was a higher percentage of PU predictions for less proficient readers, with the less proficient grade four subjects outscoring the sixth graders. The proficient readers in grade six made no PU predictions. The less proficient the reader, the greater the tendency was to make PU predictions.

PU predictions appeared to result from an incomplete understanding of the text or a lack of ability to focus on significant facts presented. For example, some of the subjects focused on the medicine bottles rather than on Nancy's plan to save them from the Indians and thus drew incorrect conclusions. Others focused on the fire and overlooked the plan. They seemed unable to evaluate the situation and select the relevant bits of information, or as Squire suggests, the reader was sidetracked by irrelevant associations. It appears that there is a need for less proficient readers to refine the selection-rejection technique in order to fully comprehend the text.

In keeping with the above, a higher percentage of inappropriate predictions (IN) occurred in the probed condition for all groups except

one. The percentage of IN predictions for less proficient readers in grade four differed little from the probed to the unprobed treatment. With or without the probe, proficient readers made fewer inappropriate predictions than the less proficient. Comparisons across grades show that in both probed and unprobed conditions, the fourth graders had higher proportions of IN predictions than did the grade six subjects. The tendency to make IN predictions appears to characterize subjects who have not yet become proficient readers. IN predictions resulted either from confusion of information or failure to select or to integrate significant clues. For example, some subjects confused the boy and the donkey in the story "Lazy Luke". In the story, "Moose Shooting", some did not relate the pictures Jerry wanted for his uncle to the "Click" of the camera to recognize the fact that the boys were shooting with a camera instead of a gun. Cognitive-oriented difficulties appeared to differentiate between the groups.

To summarize, there was a higher percentage of AA predictions given in the unprobed than in the probed condition by subjects in grades four and six regardless of reading proficiency level. All groups except proficient grade six readers gave higher proportions of AN predictions when probed. Generally, proficient readers gave a higher percentage of appropriate predictions than did the less proficient readers. PU and IN predictions were more numerous in the responses of the less proficient readers than in those of the proficient.

Supporting Evidence

In both the probed and the unprobed conditions the subjects were asked to tell why they thought as they did. The supporting evidence they gave was categorized (FS, LS, ES, IS) as shown in Tables 5.4 and 5.5 and calculated as percentages of the total number of responses made. The final category (NS) shows the proportions of responses for which no support was offered.

Since only the scores on the total number of supported responses were submitted to the three-way analysis of variance (Chapter IV), attention will be given in this section to the differences in the types of supporting evidence offered by the members of the various groups. The scores on each class of support were computed as percentages of the total number of supported responses and compared by means of the chi square technique in order to determine whether there were significant differences in the preferences of the various groups for a particular type of supporting evidence. Tables 5.41 to 5.45 and Tables 5.51 to 5.55 summarize the significant differences that were found. These will be discussed in conjunction with the consideration of the results shown in Tables 5.4 and 5.5.

It can be seen that subjects were more likely to support their responses in the probed than in the unprobed condition. The grade four subjects appeared to be more dependent than the sixth graders upon the text (FS) for this support when probed with the highest percentages in the FS column being assigned to the less proficient reading group. Table 5.41 shows that with probing, when subjects did support their responses the less proficient readers in grade four were significantly

Table 5.4

Proportion of Types of Supporting Evidence in Relation to
the Total Number of Responses Made (Probed Treatment)

Grade	Group	*FS	LS	ES	IS	NS
4	Less Proficient	28.8	30.1	9.6	16.4	15.1
4	Proficient	11.1	53.9	17.5	1.6	15.9
6	Less Proficient	7.1	51.4	12.9	11.4	17.2
6	Proficient	22.6	48.4	17.7	-	11.3

Table 5.5

Proportion of Types of Supporting Evidence in Relation to
the Total Number of Responses Made (Unprobed Treatment)

Grade	Group	*FS	LS	ES	IS	NS
4	Less Proficient	14.7	12.8	2.9	5.9	63.7
4	Proficient	25.8	24.7	2.1	2.1	45.3
6	Less Proficient	12.2	15.4	1.6	1.6	69.1
6	Proficient	37.5	18.8	8.3	5.2	30.2

*FS - Factual Support
LS - Logical Support
ES - Experiential Support

IS - Irrelevant
NS - No Support

Table 5.41

*Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Factual Support Probed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	*	**	N. S.
Gr. 4 Prof.		N. S.	N. S.
Gr. 6 L. P.			*
* $p < .05$ ** $p < .01$			

Table 5.51

Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Factual Support - Unprobed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	N. S.	N. S.	N. S.
Gr. 4 Prof.		N. S.	N. S.
Gr. 6 L. P.			N. S.

more likely than either the proficient fourth- or the less proficient sixth-graders to select FS, and that the proficient readers in grade six were significantly more likely than the less proficient readers in that grade to support responses factually. Although the differences in the unprobed condition did not reach the level of significance (Table 5.51), the analysis suggested that the proficient readers in each grade had higher scores in the FS column partly because of the tendency of less proficient readers to leave many responses unsupported. When responses were supported, all groups except the less proficient fourth graders were significantly more likely to select FS in the unprobed than in the probed condition (Table 5.46).

The tendency for subjects to reason to a logical conclusion is reflected in their scores in the logical support (LS) column (Tables 5.4 and 5.5). Percentages in this column are higher in the probed than in the unprobed condition. The proficient fourth graders appeared to be more dependent upon reasoning to support their conclusions than were the members of any other group. It should be remembered that this was also the group with the highest mean score on the intelligence test. When probed (Table 5.42) all other groups were significantly more likely to offer LS than were the less proficient fourth graders. Table 5.52 shows that in the unprobed condition, although the subjects did not support as many of their responses as they did when probed, when responses were supported both the proficient fourth graders and the less proficient sixth graders were significantly more likely to select LS than were the proficient readers in grade six. The less proficient readers in grade six, however, supported less than one-third of their responses.

Table 5.42

*Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Logical Support - Probed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	**	**	*
Gr. 4 Prof.		N. S.	N. S.
Gr. 6 L. P.			N. S.
*p < .05 ** p < .01			

Table 5.52

*Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Logical Support - Unprobed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	N. S.	N. S.	N. S.
Gr. 4 Prof.		N. S.	*
Gr. 6 L. P.			*
*p < .05 ** p < .01			

The percentages of experiential support (ES) were higher in the probed than in the unprobed condition for all groups (Tables 5.4 and 5.5). Within the probed condition the sixth graders supported higher proportions (12.9% and 17.7%) of their responses experientially than did the fourth graders (9.6% and 17.5%). In both grades proficient readers (Gr. 4: 17.5%; Gr. 6: 17.7%) supported higher proportions of their responses experientially than did the less proficient readers (Gr. 4: 9.6%; Gr. 6: 12.9%).

Within the unprobed condition, grade six had greater proportions of ES responses (1.6% and 8.3%) than did the grade four subjects (2.9% and 2.1%). There was very little difference between the less proficient (2.9%) and proficient (2.1%) fourth graders. Grade six proficient readers scored higher than the less proficient in the ES column. An examination of individual protocols suggested that the tendency for grade six readers to have higher proportions of experiential support reflected an ability to generalize rather than to make exact references to personal experiences. The χ^2 technique did not find the differences in this column significant (Tables 5.43 and 5.53).

Often subjects attempted to support a response with statements that had little or no relation to the original response. At times, when asked why they thought as they did, they merely reworded their original response. The percentages of irrelevant support (IS) were generally higher in the probed than in the unprobed condition. Within the probed condition, grade four subjects had the higher percentages of IS responses, with less proficient readers inclining more in this direction than did the proficient readers. In grade six the proficient readers had no IS

Table 5.43

Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square:
Experiential Support - Probed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	N. S.	N. S.	N. S.
Gr. 4 Prof.		N. S.	N. S.
Gr. 6 L. P.			N. S.

Table 5.53

Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square:
Experiential Support - Unprobed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	N. S.	N. S.	N. S.
Gr. 4 Prof.		N. S.	N. S.
Gr. 6 L. P.			N. S.

responses whereas the less proficient had 11.4% of their support in this column. Table 5.44 shows that the χ^2 technique found that the differences were significant when proficient and less proficient readers were compared within each grade. In addition the less proficient sixth graders were more likely to give irrelevant support than were the proficient readers in grade four.

In the unprobed condition the only significant difference in the proportions of IS responses was found between the less proficient and proficient fourth graders (Table 5.54). In grade four the less proficient readers gave more irrelevant support whereas in grade six it was the proficient. It is possible that this is accounted for by the fact that less proficient grade six subjects failed to support 69.1% of their responses.

The proportion of responses for which no support (NS) was given was much larger in the unprobed than in the probed condition. Table 5.46 shows that all groups were significantly more likely to leave responses unsupported in the unprobed condition. This in part was due to the fact that when the probe was not presented, subjects gave many responses, restatements of the text, for which it did not make sense to ask "Why do you think that?". If this were asked, the obvious response was for the subject to point to the sentence in the text. Whereas it might have been possible to add this to the total of factual support, this behaviour was not considered to be support for the reader's thinking.

Within the probed condition, there was little difference in the number of NS responses between the grades. In grade four there was very little difference between the groups. In grade six the less proficient

Table 5.44

*Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square:
Irrelevant Support - Probed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	**	N. S.	***
Gr. 4 Prof.		*	N. S.
Gr. 6 L. P.			**

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5.54

*Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: Irrelevant Support - Unprobed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. L. P.	*	N. S.	N. S.
Gr. 4 Prof.		N. S.	N. S.
Gr. 6 L. P.			N. S.

* $p < .05$

Table 5.45

Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: No Support - Probed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	N. S.	N. S.	N. S.
Gr. 4 Prof.		N. S.	N. S.
Gr. 6 L. P.			N. S.

Table 5.55

*Significant Differences in Proportions of Types of Supporting Evidence Indicated by the Application of Chi Square: No Support - Unprobed

	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	**	N. S.	***
Gr. 4 Prof.		***	*
Gr. 6 L. P.			***

* $p < .05$

** $p < .01$

*** $p < .001$

Table 5.46

Performance Under Two Treatments (Probed and Unprobed) On Certain Variables: *Significant Differences Indicated by the Application of Chi Square.

<u>Factual Support:</u>	Gr. 4 L. P.	Gr. 4 Prof.	Gr. 6 L. P.	Gr. 6 Prof.
Gr. 4 L. P.	N. S.			
Gr. 4 Prof.		***		
Gr. 6 L. P.			***	
Gr. 6 Prof.				**
<u>Logical Support:</u>				
Gr. 4 L. P.	N. S.			
Gr. 4 Prof.		N. S.		
Gr. 6 L. P.			N. S.	
Gr. 6 Prof.				**
<u>Experiential Support:</u>				
Gr. L. P.	N. S.			
Gr. 4 Prof.		**		
Gr. 6 L. P.			N. S.	
Gr. 6 Prof.				N. S.
<u>Irrelevant Support:</u>				
Gr. 4 L. P.	*			
Gr. 4 Prof.		N. S.		
Gr. 6 L. P.			N. S.	
Gr. 6 Prof.				*
<u>No Support:</u>				
Gr. 4 L. P.	***			
Gr. 4 Prof.		***		
Gr. 6 L. P.			***	
Gr. 6 Prof.				**

* $p < .05$ ** $p < .01$ *** $p < .001$

readers had more NS responses than did the proficient. In the unprobed condition grade four subjects were more likely than grade six to offer no support and in both grades the less proficient readers were more reluctant than the proficient to support their responses (Table 5.5).

In summary, the most striking pattern emerging from the analysis of the types of supporting evidence offered was the tendency toward unsupported responses in the unprobed condition and the reluctance of the less proficient to tell why they thought as they did. Generally, readers were inclined to offer factual or logical support for their responses. When probed the less proficient readers were more likely than the proficient to give irrelevant support. It is interesting to note that in both the probed and unprobed conditions, the groups making the largest number of predictions also had the highest percentage of supported responses. The group making the fewest predictions had the lowest percentage of supported responses. It would appear that there may be a relationship between the ability to predict and the ability to support conclusions.

Levels of Thought

The complex interrelationship of reading and reasoning set forth in Chapter II suggested an exploration of the predictive process according to the levels of thinking involved in the subjects' responses to stories. The basic question underlying this approach was "In responding to print can proficient and less proficient readers engage in higher levels of thinking when structured to do so by the investigator and, if so, do they engage in the same levels of thought in the absence of the probe?". As described earlier, the stories used in the study were con-

structured and segmented in such a manner as to elicit both convergent and divergent responses. By considering separately the responses in the probed and unprobed conditions, it was anticipated that any differences which appeared would respond to the basic question.

Tables 5.6 and 5.7 summarize the proportions of the total number of responses that were assigned to each of the categories of thought in the probed and unprobed conditions. Subjects generally, were more fluent in the absence of the probe, with less proficient readers making more responses than the proficient. This finding contradicts the popular view that less proficient readers are also less verbal in response to print.

Table 5.6 shows that in the probed condition grade four subjects had higher proportions of cognitive memory (CM) productions than did the sixth graders, with the less proficient members of each grade showing the greater tendency to state facts that already had been presented. However, when less proficient sixth graders and proficient fourth graders are compared it can be seen that the former had 7.1% of their responses in this column compared with 4.8% for the latter, who were not inclined to recite the details of the story. In the unprobed condition the proportions of CM productions increased significantly for all groups. The most striking feature is the high proportion (64.2%) of the responses of the less proficient grade six readers which was assigned to this category. These subjects seemed to equate reporting their thoughts as they read with retelling the events of the story. This feature, although present in the responses of the less proficient grade four subjects was not so marked as in those of the less proficient sixth

Table 5.6

Proportion of Levels of Thought in Relation to the Total
Number of Responses Made (Probed Treatment)

Grade	Group	Number of Responses	*CM	CP	DP	EP	OP
4	Less Proficient	73	8.2	32.9	49.3	1.4	8.2
4	Proficient	63	4.8	25.4	65.1	-	4.8
6	Less Proficient	70	7.1	31.4	44.3	8.6	8.6
6	Proficient	62	1.6	27.4	69.3	-	1.6

Table 5.7

Proportion of Levels of Thought in Relation to the Total
Number of Responses Made (Unprobed Treatment)

Grade	Group	Number of Responses	*CM	CP	DP	EP	OP
4	Less Proficient	102	41.2	30.4	8.8	16.7	2.9
4	Proficient	97	26.8	14.4	32.9	14.4	11.3
6	Less Proficient	123	64.2	19.5	8.1	6.5	1.6
6	Proficient	96	15.6	30.2	41.6	9.3	3.1

- * CM - Cognitive Memory Productions
 CP - Convergent Productions
 DP - Divergent Productions
 EP - Evaluative Productions
 OP - Other Productions

graders. It is possible that readers learn through experience to react to stories in this manner. The more proficient the reader, the less inclined he was to make CM productions.

The convergent productions (CP) column indicates that when probed the less proficient readers made slightly higher proportions of CP responses than did their proficient counterparts in both grades. Without the probe this held true only for the grade four subjects. Only 19.5% of the responses of less proficient grade six readers were convergent, whereas 30.2% of those of the proficient readers were convergent. The high percentage of CM productions given by the former resulted in low proportions of responses in all other columns.

Whether they were probed or not, proficient readers had the highest percentage of their responses in the divergent productions (DP) column. In both treatment conditions, the differences are wide between the proficient and less proficient readers on this variable. While divergent thinking appears to characterize proficient readers at both grade levels, higher proportions of the responses of proficient grade six subjects were divergent, indicating a more advanced level of cognitive development.

The number of evaluative productions (EP) given generally was small, the highest proportions appearing in the unprobed condition. The low scores in the probed condition reflect the nature of the probe that was given. Probing also accounted for the fact that proficient readers made no EP responses. In the unprobed condition, grade four subjects had a higher proportion of their responses in the EP column than did the grade sixes. Whereas 9.3% of the responses of proficient grade six readers were in the EP column, only 6.5% of the responses of the less

proficient grade six subjects were evaluative.

The other productions (OP) column included "I don't know" responses, responses which clearly indicated a misinterpretation of the text, and several statements which were only partially audible. In the probed condition, these were more numerous in the responses of the less proficient. In the unprobed condition, proficient fourth graders had a higher proportion (11.3%) of OP responses than had the readers of any other group.

It is important to note that in the unprobed condition, there is a similarity of patterns of responses for the less proficient readers in both grades. The percentage scores in each column vary little from grade four to grade six. The response pattern of the proficient fourth graders more closely approximates that of the proficient sixth graders than it does the pattern of the less proficient readers in grade six. When responding to stories proficient readers appear to be characterized by similar patterns of thinking which are more divergent than those of the less proficient. The latter gave higher proportions of CM and EP responses and slightly higher proportions of CP responses.

In the absence of the probe (Table 5.7) to structure their thinking, all groups showed an increase in the proportion of CM productions, the greatest increase in the proportion being for the less proficient grade six subjects and the least for the proficient sixth graders. The tendency for subjects, particularly less proficient readers, to retell the story in spite of the fact that the directions included the sentences, "I do not mean for you to tell me what the story is about. Tell me just the things you think about as you read it," continued to

persist. CM productions comprised the largest portion of the responses of less proficient readers in both grades. One less proficient reader in grade six made a total of twenty-eight restatements of the text as she read without probing. Gallagher's (1965) observation, that cognitive memory was the most prevalent kind of thinking occurring in his analysis of classroom interaction, may have some application to reading, at least to the independent reading of less proficient readers. In his study, convergent thinking ranked second with only a small percentage of the verbal transactions representing divergent or evaluative thinking.

It is of interest to note that in comparing readers on this (CM) variable that differences between the less proficient and proficient are magnified in the less structured unprobed condition. In the same manner, differences in the proportions of CM productions by proficient grades four and six readers are larger in the unprobed condition. This is an indication that the proficient grade six subjects, who have achieved a higher level of cognitive development, are less inclined toward low level thinking and mere recitation when reading independently than are the less mature proficient readers. It is a matter of concern that too often the questions posed by teachers encourage the lower levels of thought even in proficient readers who, apparently, when left to their own resources operate on higher levels. Similar trends (Table 5.7) can be seen when the proficient readers are compared on other (CP, DP) variables.

All groups except proficient sixth graders gave fewer convergent productions when reading without probing. An examination of individual protocols suggests a need for caution in making generalizations from

these scores. Factors specific to one particular story or to one group of subjects appear to have influenced the scores. For example, when reading the story, "The Most Dangerous Animal" the less proficient fourth graders tended to make many guesses as to the identity of the animal, whereas proficient fourth graders were willing to wait for a significant bit of information before making a guess. This resulted in fewer CP responses for the latter.

Since divergent productions were elicited by the probe, it is not surprising that the number of DP responses in the unprobed condition decreased for all groups. The very significant decrease for the less proficient readers in each grade, however, is somewhat alarming. Both the proficient fourth graders with 32.9% of their responses in this column and the proficient sixth graders with 41.6% think divergently without probing. The fact that the percentage score (65.1%) of the proficient grade four readers dropped to 32.9% when probing was discontinued, whereas that of the proficient sixth graders dropped only from 69.3% to 41.6%, indicating a stronger tendency toward divergent thinking on the part of the latter when reading independently, suggests the developmental nature of divergent thinking. The difference in the proportion of DP responses from the probed to the unprobed condition is sufficiently wide to support a conclusion that readers from all groups are capable of divergent thinking when they are structured to do so by the investigator; however, only the proficient readers tend toward divergent thinking with any degree of consistency when reading independently.

In the unprobed condition there was an increase in the number of evaluative productions for all but the less proficient readers in grade

six, with notable difference between the grades. The grade four readers appeared to be very sensitive to the feelings and emotions of the characters in the stories. Responses in this category from the grade six readers often were modifications or judgments about a former response as new information was received. Once again, any conclusions based upon these scores must be extremely tentative. Some subjects, although not expressing these modifications, indicated the same through facial expressions or gestures.

Table 5.7 shows that the number of OP responses given by less proficient readers decreased when the probe was not present. This can be accounted for by the absence of "I don't know" responses when subjects were free to respond at will. Two students who made a number of responses which were only partially audible and one who confused the boy with the donkey in "Lazy Luke" accounted for the increase in OP responses from the proficient fourth graders.

In summary, Table 5.6 and Table 5.7 show that proficient and less proficient readers in grades four and six engage in divergent and convergent thinking when reading, but that the extent to which they employ these levels of thought when reading independently varies according to the proficiency level of the readers. Another important aspect of this analysis was the emergence of patterns of responses to print which appear to characterize proficient and less proficient readers.

Comprehension of the Stories

The relationship between prediction and comprehension was explored by means of comprehension tests on each of the stories. Information gained from comparison of the achievement scores on these tests was sup-

plemented by the findings of the qualitative analysis which considered the responses to specific elements within each of the stories.

Table 5.8 presents the mean scores achieved on the comprehension tests based on the four stories. An examination of the scores indicates that probing appeared to have little effect on the comprehension scores since there is little difference between columns. It is of interest to note that although differences are slight, less proficient readers made their highest scores when probed and proficient readers made their highest scores without probing. Research should be designed to investigate this further. It may be that too much guidance in silent reading is a hindrance to capable readers. As expected, in both grades proficient readers scored higher than less proficient.

Table 5.8
Mean Scores on Tests of Comprehension
of Stories Read

Grade	Group	Comprehension *Scores Probed	Comprehension *Scores Unprobed
4	Less Proficient	13.4	12.9
4	Proficient	17.0	17.4
6	Less Proficient	16.5	15.0
6	Proficient	16.9	17.6

* Out of 20.

There was little difference between the comprehension scores of the proficient readers in grades four and six. The multiple choice tests apparently were not sufficiently challenging to differentiate between the two groups of proficient readers. The fact that the stories were written

at an early fourth grade level made it difficult to construct tests that would be challenging to proficient readers.

An analysis of individual items on the tests in relation to the predictions that were given suggested that both the position in the story and the degree of accuracy of the prediction influenced the performance on the tests. Although this analysis was necessarily of a subjective nature, it provided worthwhile information.

Each incorrect response on the test was considered in relation to the predictions that the subjects had made. Several items in each story appeared to be incorrectly chosen by subjects who had made predictions which were not in accord with the events in the story. These will be discussed separately for each of the stories.

Moose Shooting: Subjects who failed to predict that Bud and Jerry were going to take pictures rather than kill the moose gave incorrect responses to questions 7, 8, 9 and 10. They were unable to define such words as "equipment", "Successful" and "collection" within the context of the story even though they were told at the end of the selection that the boys went home to develop their film. They were unable to decide whether Jerry had taken pictures before because they were not aware of clues related to this question as they read the story.

Lazy Luke: Subjects who had failed to predict that Luke's plan was to fall into the stream so that his load would get lighter gave incorrect responses to question 3. They seemed not to recognize the fact that his accidental fall gave him the idea for the events which took place thereafter.

On the Spot: Subjects who failed to predict Nancy's plan when she noticed that the berry juice had made a red spot on her hand were unable to ans-

wer correctly questions 3, 4 and 7. They did not know what gave Nancy the idea for her plan to save herself and Grandmother nor were they able to correctly define getting "fixed up" or to tell why the Indians disappeared at the end of the story.

The Most Dangerous Animal: Subjects who did not guess that the animal was a fly or those who had guessed it very late in the story gave incorrect responses to the question about the breeding place of the fly. Other detail questions about flies they missed, possibly because they were not aware that the story was about flies when these clues were given.

It was sometimes difficult to determine with certainty whether or not the reader had predicted. Often in the responses there were indications that hypotheses had been formulated although not stated. For example, one subject's response was "I think Nancy will save them from the Indians because the juice turned her hand red." Others were more explicit and went on to tell how she would use the juice to fool the Indians. Some chose to give more detailed responses than others. It is because decisions were sometimes made based upon the subject's total response to the story that this informal analysis is considered somewhat subjective. Examples of comprehension scores being influenced by inappropriate predictions were more numerous in the tests of the less proficient than of the proficient readers.

It was suggested above that the subject's response to several items on each of the tests appeared to be influenced by his failure to predict at an appropriate point in the story. The four stories were analyzed in order to determine which portions of information in each story appeared to be essential to the readers' understanding of the

selection. In "The Most Dangerous Animal" (DA) the prediction of the identity of the animal was considered crucial to the comprehension of the story. In "Lazy Luke" (LL) the conclusion that Luke's accidental fall gave him the idea for future falls was significant. In "Moose Shooting" (MS) the fact that the boys were shooting with a camera rather than with a gun was the pertinent prediction. Finally, the plan which came to Nancy's mind when she saw that the berry juice made a red spot on her hand was considered to be the prediction essential to the understanding of "On the Spot" (OS). Individual protocols were examined to find how many subjects had predicted these events.

The questions on the comprehension tests were then considered in order to determine which items focused on these four essential predictions. On the test based upon the story "The Most Dangerous Animal" there were four questions whose successful completion appeared to be contingent upon an early prediction of the identity of the animal. On the test based upon the story "Lazy Luke" one item centered on the essential prediction. In "Moose Shooting" and "On the Spot" the number of items focusing on the essential predictions were four and three respectively.

This analysis is summarized in Table 5.9 which shows the number of test items which focused on the essential prediction in each story. It gives the number of subjects who made the predictions discussed above and the number who failed to predict these events. The number of incorrect responses given by these subjects to the test items focusing on the essential predictions is shown. It can be seen that the four subjects who predicted the identity of the animal in DA made only two incorrect

responses on the four test items focusing upon this information whereas the twenty-eight subjects who failed to predict made thirty-four incorrect responses on these four items. Similarly, in LL the nineteen subjects who predicted Luke's plan made only one incorrect response on the pertinent test item whereas the thirteen subjects who failed to predict made six errors. Subjects who had predicted were less inclined to select incorrect answers to the test items focusing upon the essential information concerned. If, as indicated earlier, the comprehension tests were not sufficiently challenging for proficient readers, it may be that a more challenging test would reveal an even stronger relationship between predicting and comprehending than that indicated in Table 5.9. In all four stories subjects who had failed to predict had lower scores on these particular items than did the readers who had predicted.

Table 5.9

Relationship: Prediction and Comprehension

Story	Test Items Focusing on Essential Predictions	Subjects Making Essential Predictions	Subjects Failing to Predict	Incorrect Responses by Subjects Making Predictions	Incorrect Responses by Subjects Failing to Predict
DA	4	4	28	2	34
LL	1	19	13	1	6
MS	4	6	26	3	31
OS	3	10	22	3	17

Although subjective, this informal analysis clearly shows the relationship between comprehension scores and the number of appropriate pre-

dictions given. Appropriate predictions appeared to alert the reader to details that were essential to his comprehension of the story. The fact that he had predicted accurately appeared to guide him in the selection of significant portions of information. The total test scores showed that the proficient readers with a greater tendency to predict, and to predict accurately, better comprehended what they read.

Evidence that the three-step cycle of anticipation, prediction and hypotheses checking was operating was provided by both facial expressions and comments. Subjects were observed to smile, nod or at times to comment that their predictions had been accurate. Such comments as "I was right" were more frequent in the responses of the proficient grade six readers than of the others; however, the process of confirmation of predictions appeared to be operating whether or not the subjects chose to express these thoughts. Their willingness to change their predictions when conflicting information was received was particularly evident in the story "The Most Dangerous Animal". The informal analysis revealed greater flexibility on the part of proficient readers to reassess their previous hypotheses. At times they explained why these no longer could fit the situation. Because they better comprehended the information that already had been provided, they were more alert to new information which conflicted with their hypotheses.

The informal analysis revealed also that it was when comprehension of the selection appeared to break down that subjects who had predicted in the early portion of the story would resort to a retelling procedure for the remaining portion. The nature of the relationship between prediction and comprehension requires further exploration.

Relationship: Prediction and Organizational Patterns

It was suggested in Chapter II that the reader's knowledge of syntactic patterns on the sentence level influences his expectations and helps him to predict unknown words as he reads. It was hypothesized that his knowledge of events on the story level would influence his ability to predict ideationally. An examination of the complexity of the structural characteristics of text, a matter of concern to those seeking to construct materials which differ in systematically controlled ways, was not a major thrust in this study. However, the results of an informal appraisal of the predictive process in stories differing in organizational patterns deserves some comment.

Thorndyke's (1976) work, indicating that adults have a structure for simple stories stored in memory and that they use this "learned organizational framework" as a means of comprehending and encoding the information in a particular story, suggests a relationship between the structural pattern of the selection and the reader's predictions. It is possible that the frequency and quality of prediction varies with the pattern and content of the story. There was no attempt in this investigation to make a detailed micro-analysis of the stories. Rather, the informal analysis focused on the macro-structure and organizational patterns of the selections. Several variations of organizational patterns were built into the stories.

The passages used included both description and simple narrative prose. The story "The Most Dangerous Animal" (DA) was informational type prose. "Lazy Luke" (LL) and "Moose Shooting" (MS) were simple narrative

prose, the former emphasizing causal relationships and the latter being concerned with temporal sequencing. "On the Spot" (OS) had the additional element of problem solving and was the longest story in the group. Because some evidence (Squire, 1964; Meckel, 1946; Loban, 1949) has been presented to suggest that content, in general, and the sex of the main characters, in particular, influence the subjects' reactions to the stories, a variety of main characters was used in order to explore this aspect. Two of the stories (DA & LL) had animals as the main characters, one (OS) had a girl and the other (MS) had two boys assuming the major role. Response patterns relative to each story are discussed below.

Figures 5.1 to 5.11 summarize the difference in the performance of the boys and girls on certain variables in each of the four stories. The longest story (OS), the one in which the problem-solving element was added, elicited the largest number of responses, whereas the fewest responses appeared in the simple narrative (MS) emphasizing temporal sequencing. This same pattern was revealed when the scores were compared on the number of predictions made, the appropriate and inappropriate predictions and the number of supported responses. The narrative emphasizing causal relationships (LL) yielded the highest comprehension scores. The description-information selection (DA) which was designed to elicit convergent hypotheses resulted, as expected, in high scores in the CP column for less proficient readers. In the unprobed condition however, where subjects structured their own responses, the number of CP responses given in DA was not sufficiently large to justify the conclusion that the structural features determined the nature of the response. Neither was the number of unprobed responses assigned to the DP column

in the story (OS) designed to stimulate divergent thinking sufficiently large to support such a conclusion. Although structural features appeared to influence the nature of the response, probing played a more significant role in determining the level of thinking engaged.

Some differences in performance based on the sex of the reader can be seen (Figures 5.1 - 5.11). The girls, who made 348 responses, were only slightly more verbal than the boys who responded 338 times (Figure 5.1). The two stories, DA & LL, yielded more responses from girls than from boys. OS, the story which had a girl as the main character, resulted in more responses from the boys. Many of the boys appeared to be excited by the danger involved in the possible attack by the Indians in this selection. The boys were far more responsive than the girls in MS, the story with two boys as the main characters. Features other than the sex of the leading character appeared to be playing a significant role in determining the verbal fluency of the respondents.

Figure 5.3 shows that girls made a slightly higher number of predictions than did the boys. Similarly, they made more appropriate and more inappropriate predictions (Figures 5.4 and 5.6). The boys were somewhat more likely to support their responses than were the girls.

When boys and girls were compared on the levels of thought involved in their responses, Figures 5.7 to 5.10 show that boys had higher scores in the CP and DP columns, whereas girls scored higher in the CM and EP columns.

There was very little difference in the total comprehension scores; however, when the comprehension scores on individual stories are examined (Figure 5.11), it is seen that the girls scored higher than the

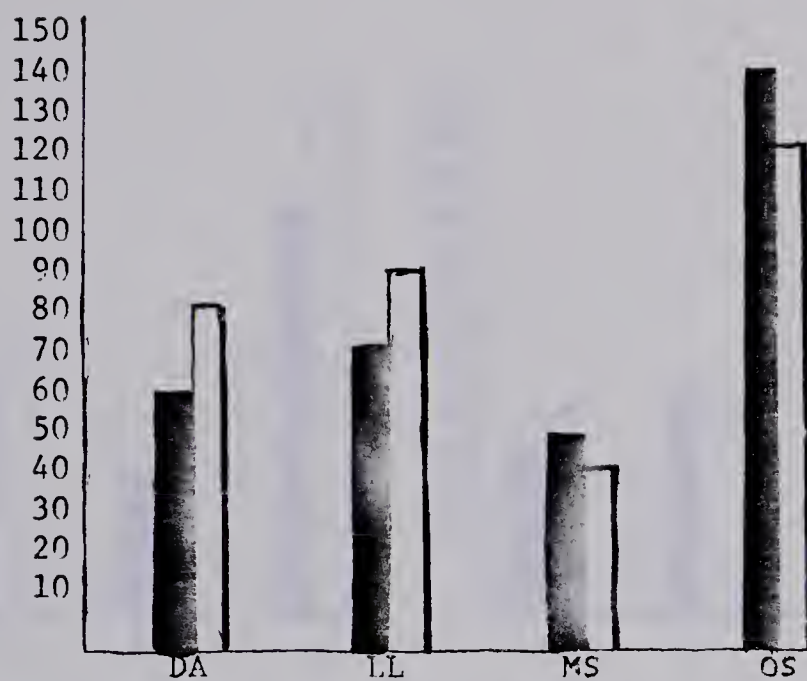


Figure 5.1 Number of Responses Made by Boys and Girls

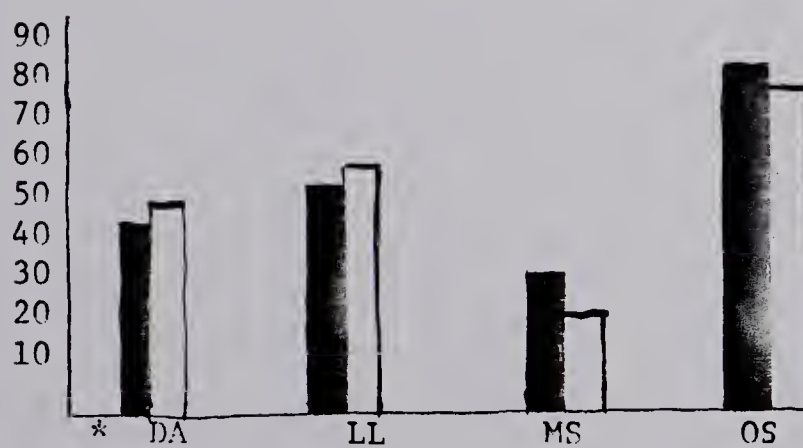
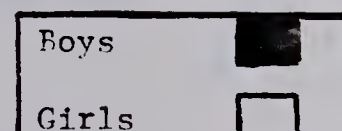


Figure 5.2 Supported Responses Made by Boys and Girls

- * DA - The Most Dangerous Animal
 LL - Lazy Luke
 MS - Moose Shooting
 OS - On the Spot



Kinds of Predictions

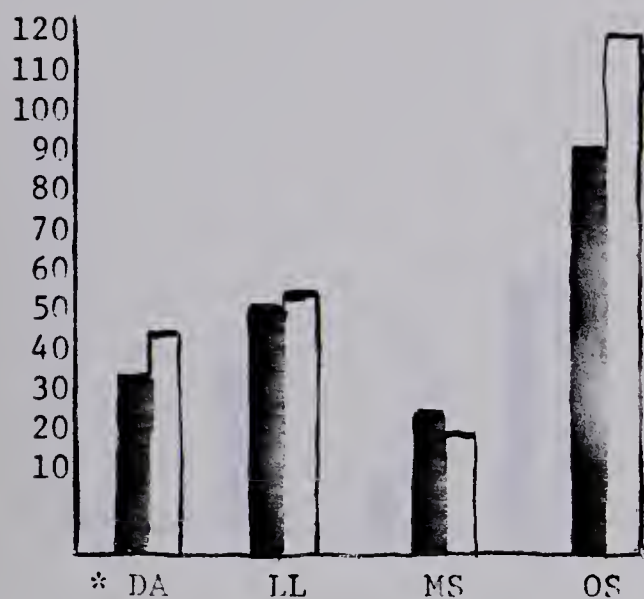


Figure 5.3 Number of Predictions Made by Boys and Girls

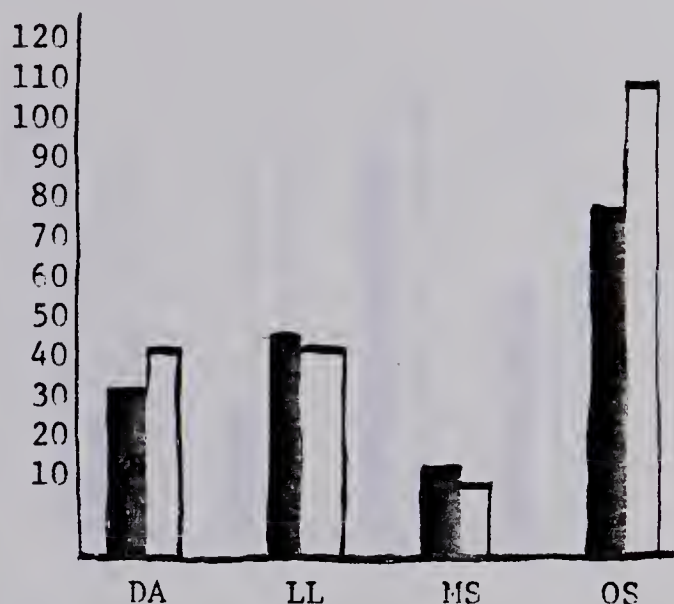


Figure 5.4 Appropriate Predictions Made by Boys and Girls



* DA - The Most Dangerous Animal
 LL - Lazy Luke

MS - Moose Shooting
 OS - On the Spot

Kinds of Predictions

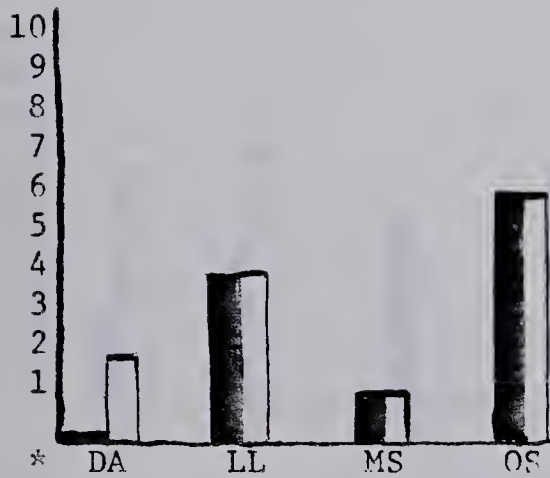


Figure 5.5 Plausible but
Unlikely Predictions
Made by Boys and
Girls

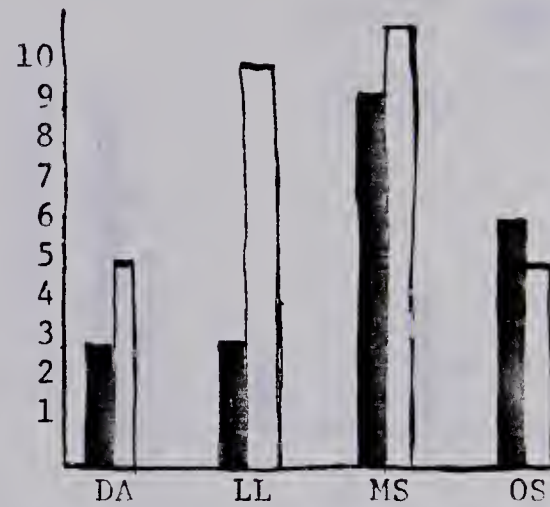
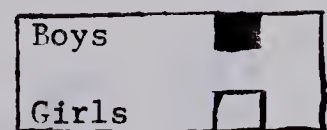


Figure 5.6 Inappropriate Predictions
Made by Boys and Girls



- * DA - The Most Dangerous Animal
 LL - Lazy Luke
 MS - Moose Shooting
 OS - On the Spot

Levels of Thought

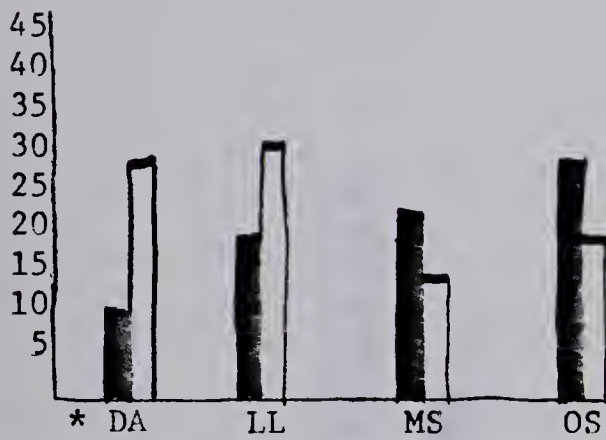


Figure 5.7 Cognitive Memory Productions Given by Boys and Girls

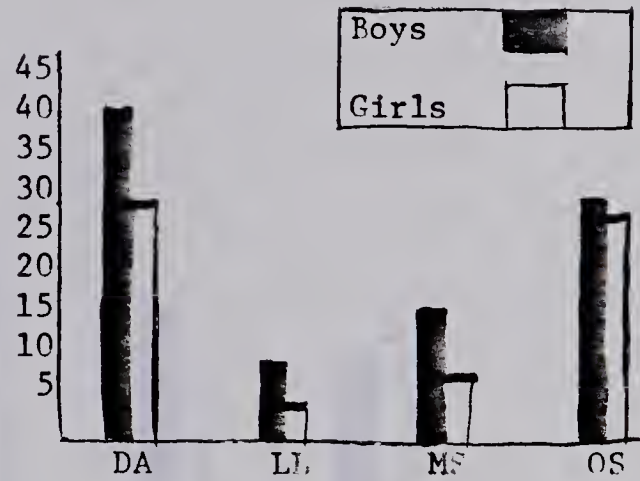


Figure 5.8 Convergent Productions Given by Boys and Girls

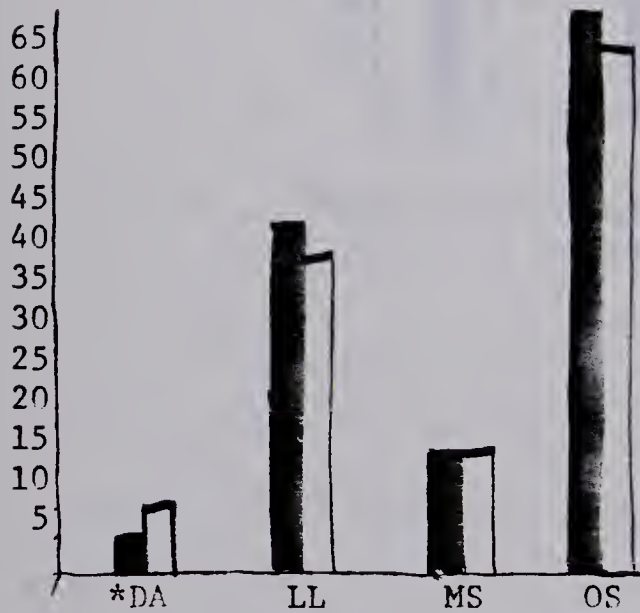


Figure 5.9 Divergent Productions Given by Boys and Girls

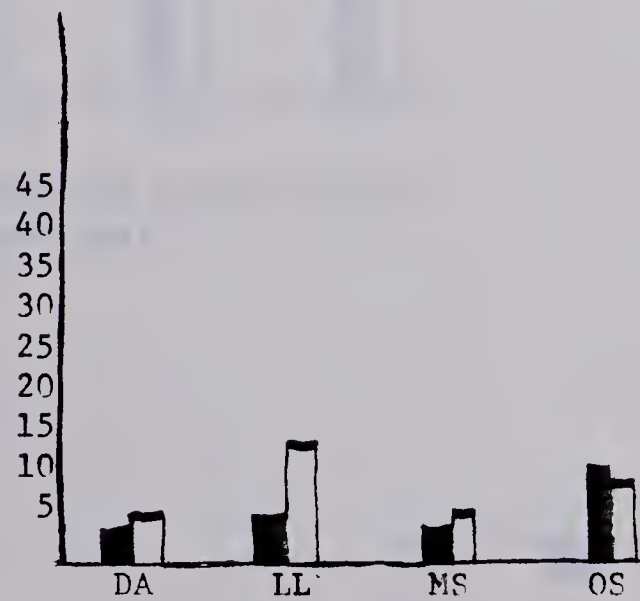


Figure 5.10 Evaluative Productions Given by Boys and Girls

* DA - The Most Dangerous Animal
LL - Lazy Luke

MS - Moose Shooting
OS - On the Spot

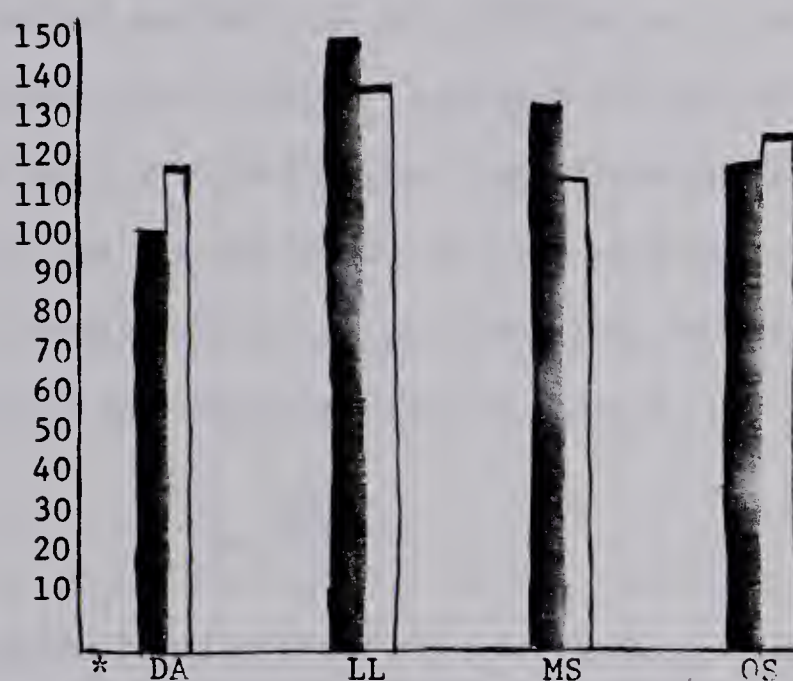
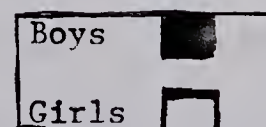


Figure 5.11 Comprehension Scores Made by Boys and Girls



* DA - The Most Dangerous Animal
LL - Lazy Luke

MS - Moose Shooting
OS - On the Spot

boys on DA & OS, whereas the boys had better comprehension of LL & MS. In addition, the girls made more predictions when reading these same two stories (DA & OS). It is possible that the sex of the main character may affect comprehension and the number of predictions made even though it could not be shown to influence the number of responses.

The informal analysis of the differences in performance of the subjects from one story to another provided evidence that both the frequency and the quality of the predictions made when reading are influenced by the pattern and content of the stories presented and that the teacher who guides the reading plays a significant role in determining the thought processes involved as readers respond to stories.

Summary

Information obtained from the qualitative analysis of the responses of readers in grades four and six was the subject matter of this chapter. An examination of the number and kinds of predictions made showed that although an equal number of prediction was given from both grades when subjects were probed, this was not a simple matter of all readers making a prediction when the probe was given. There was wide variation from one subject to another within the groups. For example, the number of predictions given by individual subjects in grade four ranged from five to fifteen. In grade six the range was from five to twenty-one. However, when totals were compared, it was only when reading independently that the grade six subjects made more predictions than the fourth graders. It was in the unprobed condition also that differences between the two proficiency levels within each grade appeared.

Perhaps the most significant information was obtained by comparing

the individual's probed score with his unprobed score and similarly, the group's probed score with its unprobed score. At both grade levels, the significant differences between these two scores for less proficient readers showed that in spite of an ability to predict, they did very little hypothesizing when reading independently. Two subjects, one from each grade, made no predictions when reading without probing. Differences between the number of predictions given in the probed and unprobed conditions were much smaller for proficient readers, becoming almost negligible at the grade six level. If, as is indicated elsewhere in this study, prediction in reading is a skill to be desired, it should be a matter of some concern that the less proficient grade six readers scored lower than both proficient and less proficient fourth graders.

The informal analysis showed that the grade six subjects predicted more appropriately than did those of grade four and that the proficient readers were more likely than the less proficient to make appropriate predictions. Greater proportions of the predictions given in the unprobed than in the probed condition were appropriate. When reading independently, the better readers were more venturesome than were the less proficient. Inappropriate predictions were more frequent in the responses of the latter.

There appeared to be a relationship between the tendency to predict while reading and the ability to support conclusions. The group making the largest number of predictions had the highest percentage of supported responses. The group making the fewest predictions had the lowest percentage of supported responses. Proficient readers offered more support than did the less proficient.

The qualitative analysis revealed a relationship between the num-

ber of predictions made and the thought processes involved in the responses. Subjects with high scores in the DP column predicted frequently, those with high scores in the CM column made a limited number of predictions. The emergence of patterns of thought characterizing proficient and less proficient readers responding to the stories was an important feature of the analysis.

A relationship was established between predicting and comprehending. The groups which made the largest number of predictions when reading independently had the highest mean scores on the comprehension tests. Subjects who scored low on comprehension tests were more likely to predict inappropriately than were the high scorers.

The qualitative analysis suggested that the proficient readers in the sample were characterized by a tendency to predict, to predict appropriately, to support their responses, to think divergently and to make high scores on comprehension tests. On the other hand, the less proficient readers were shown to predict less frequently, to make more plausible but unlikely and inappropriate predictions, to be less able to support their responses, to give more restatements of the text and to have lower comprehension scores than their proficient counterparts.

Although it was found that both the organizational pattern and the content of the stories influenced the reader's reaction to the selection, there appeared to be other affective factors operating in the predictive process. Some differences in the reactions to the stories due to the sex of the respondents were noted; however, sex did not emerge as a major factor influencing the predictive process in young readers. This is in keeping with the conclusions of Petre (1970)

who found that boys and girls did equally well in their responses to DR-TA type instruction. The girls in this sample made a slightly higher number of responses than did the boys and consequently, made more predictions. It would be extremely hazardous to generalize beyond the groups involved in this study as individual scores varied greatly within the groups.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Few would dispute the desirability of such competencies as the ability to read between the lines and beyond the lines and to make an educated guess in reading. Whereas it has been assumed that most readers either have or will achieve these competencies, the data base for such assumptions is very limited. The study has explored the nature of these competencies and has assigned to them an important role in reading comprehension.

Chapter VI provides a brief summary of the investigation, outlines the major findings and presents the conclusions derived from these findings. Educational implications and suggestion for further research conclude the chapter.

Summary of the Study

An exploration of the nature of prediction in reading was the aim of the investigation. In particular, it focused on the number and kinds of predictions, the types of supporting evidence and the levels of thinking observed in the responses of proficient and less proficient readers in grades four and six.

Thirty-two subjects from two elementary schools in Halifax, Nova Scotia, selected on the basis of their proficiency in reading, responded to four stories, two probed and two unprobed. The responses were categorized in keeping with the focus of the study and the reliabil-

ity of the classifications was established by the investigator and three independent judges.

Statistical analysis of the quantified data revealed differences in the predictive process based on grade, group and treatment. The qualitative analysis described the data in relation to the cognitive processes involved in prediction in reading. The conclusions from the two analyses are presented below.

Conclusions from the Investigation

The discussion in this section will address the twelve research questions set forth in Chapter I. Some of the areas questioned were explored by means of an informal analysis of the responses and some by statistical procedures. Where statistical analyses were used, null hypotheses were generated. The research questions and the accompanying hypotheses are listed below and followed by a discussion of the findings.

Research Question 1

- a) Do proficient and less proficient readers in grades four and six anticipate and predict coming events when reading continuous discourse?
- b) Do less proficient readers in grades four and six predict as frequently as do proficient readers when reading continuous discourse?

Hypothesis 1.0:

There is no significant difference in the number of predictions made due to

- 1.1 grade
- 1.2 group
- 1.3 treatment.

Hypothesis 1.1: The number of predictions made by subjects in grade six was larger than that of the grade four subjects. Since the

difference was not significant, hypothesis 1.1 was not rejected. The proficient grade six readers made more predictions than the proficient fourth graders. The less proficient grade six readers made fewer predictions than either the proficient or the less proficient fourth graders.

Hypothesis 1.2: In both sets of stories the differences in the number of predictions due to group were significant causing the rejection of hypothesis 1.2. The greatest total number of predictions (160) was given by the proficient grade six subjects. This was followed by the proficient fourth graders (123), the less proficient fourth graders (98) and the less proficient sixth graders (86). See Table 5.1, page 123.

Hypothesis 1.3: Differences in the number of predictions due to treatment were significant in both sets of stories. Hypothesis 1.3 was therefore rejected. For all groups the number of predictions given when probed exceeded that given in the unprobed condition (See Table 5.1, page 118). The extent of the difference varied from one group to another, with the less proficient fourth graders showing the largest difference (48) from the probed to the unprobed condition. This was followed in order by the less proficient sixth graders (36), the proficient fourth graders (17) and the proficient readers in grade six (8). It should be noted that the latter predicted almost as often when reading independently as they did when probed.

There was wide variation in the patterns of prediction of the thirty-two subjects in the sample. All readers were able to predict when their thinking was guided by the investigator. There were some differences, although not significant, in the number of predictions given due to grade. The grade six subjects predicted more frequently than did the pupils in grade four, indicating that prediction in reading is a skill

which develops as the subjects gain maturity in reading.

More striking than the differences in the number of predictions due to grade are the group differences based on the proficiency level of the readers. Prediction appears to be a characteristic of proficient reading, whereas the responses of the less proficient are characterized by a backward-looking approach designed to assist the reader in the recitation of the details of the story. The better readers tended to interact with the story and to anticipate what new information would follow.

A similarity of patterns of responses between the proficient readers in both grades emerged. It is a matter of some concern that when the response patterns of the four groups are compared, the pattern of the less proficient grade six readers differs greatly from that of the proficient readers in that grade, more in fact than do the response patterns of either group of grade four subjects. It appears that as less proficient readers pass through the grades they perform a less active role in reading and adopt as their reading purpose the restatement of the details of the story. They become less inclined toward reasoning and problem solving and cease to set their own purpose for reading. The fact that this approach was used in a variety of stories suggested that the content of the selection had limited influence upon the degree of active thought involvement on the part of some of the less proficient readers.

The significant effects due to probing, which were revealed in all stories, emphasize the dependence particularly of less proficient readers upon the guidance of the teacher in stimulating the higher

thought levels. The proficient grade six readers, whose scores were affected very little by probing, appeared to have reached a level of reading maturity which enabled them to structure their own reading. The proficient fourth graders who are developing this maturity, were only somewhat more dependent upon the guidance provided by the investigator.

There were no subjects who did not predict in at least some of the stories. All subjects predicted when probed. One less proficient reader in grade four and one in grade six did not predict in the unprobed condition. It would be reasonable to conclude from this that there are readers who, when reading independently, do not anticipate and predict coming events. At least if they did predict, they did not report it. The fact that both of these subjects read two stories unprobed suggests that this reluctance to predict was not content-related. The data support a conclusion that all readers can predict but that not all readers do predict when reading independently.

The analysis revealed wide differences in the number of predictions made by individuals within the groups. In grade four the less proficient and proficient readers predicted with similar frequency when probed, but the latter made more than twice as many predictions as their less proficient counterparts when reading independently. In grade six proficient readers predicted much more frequently than did the less proficient, giving three times as many predictions in the unprobed condition. The conclusion indicated by the data is that the higher the proficiency level of the reader, the greater the frequency of his predictions, particularly when he reads independently. The analysis showed also that there is a relationship between predicting when

reading and thinking divergently. Subjects who scored high on divergent thinking also had high scores on the number of predictions given. These same subjects were able to support more of their responses than were the subjects who had low scores on the number of predictions given. The positive relationship between predicting, thinking divergently and supporting responses reached the level of significance.

Research Question 2

Is there a difference in the number of appropriate predictions made by proficient and less proficient readers in grades four and six when reading continuous discourse?

Hypothesis 2.0:

There is no significant difference in the number of appropriate predictions made due to

2.1 grade

2.2 group

2.3 treatment.

Hypothesis 2.1: In both sets of stories the grade six subjects made more appropriate predictions than pupils in grade four. Although the effects due to grade did not reach the level of significance, in DA & LL the differences approached significance ($p < .06$). The rejection of hypothesis 2.1 was therefore, not indicated.

Hypothesis 2.2: The ability to predict appropriately varied according to the proficiency level of the readers. The proficient grade six subjects made the greatest number of appropriate predictions. This was followed in order by the proficient fourth graders, the less proficient fourth graders and the less proficient readers in grade six. With both sets of stories revealing significant effects due to group, hypothesis 2.2 was rejected.

Hypothesis 2.3: With the exception of the proficient grade six readers who made almost equal numbers under both treatment conditions, all groups made more appropriate predictions in the probed than in the unprobed condition. Only in DA & LL did the difference due to treatment reach the level of significance; therefore, hypothesis 2.3 was upheld. The greatest difference between the probed and unprobed scores was for the less proficient readers.

Appropriate predictions were more numerous than any other kind in the responses of subjects of all groups. Not only did proficient readers make a larger number of predictions, but a higher proportion of the predictions of proficient readers was appropriate. Although the less proficient grade six readers made fewer predictions than did their less proficient counterparts in grade four, a higher proportion of the predictions they gave was appropriate. Once again similar patterns are noted for the less proficient and for the proficient groups. For example, the wide difference between the two treatments for the less proficient readers contrasted with the smaller differences between the two treatment conditions for proficient readers.

A further classification of appropriate predictions into those which were in accord (AA) with the events in the story and those which were not (AN) revealed higher proportions of AA predictions for the proficient grade six readers and the lowest for the less proficient fourth graders. Proficient readers were more skillful in selecting significant clues which enabled them to predict events likely to take place in the story.

Research Question 3

Is there a difference in the number of plausible but unlikely predictions made by proficient and less proficient readers in grades four and six when reading continuous discourse?

Hypothesis 3.0:

There is no significant difference in the number of plausible but unlikely predictions made due to

3.1 grade

3.2 group

3.3 treatment.

Hypothesis 3.1: Since the number of plausible but unlikely predictions was not large, the difference between the grades was not significant. Hypothesis 3.1 was, therefore, upheld. Where differences did exist, the grade four subjects had higher scores than the sixth graders.

Hypothesis 3.2: Differences in the number of plausible but unlikely predictions due to proficiency level were not significant; therefore, hypothesis 3.2 was not rejected. The less proficient readers in both grades made more plausible but unlikely predictions than did the proficient readers.

Hypothesis 3.3: Since the differences in the number of plausible but unlikely predictions (PU) due to treatment were not significant, hypothesis 3.3 was upheld. More PU predictions were given in the probed than in the unprobed condition and the difference at times approached, but did not reach the level of significance.

Only a small proportion of the predictions given by any of the groups fell into this category. The less proficient fourth graders, with approximately one-tenth of their predictions plausible but unlikely, had the greatest number. Although this variable did not differentiate

significantly among the groups, the analysis provided further support for a belief in the existence of general patterns of responses which appeared to be emerging from the analyses of the other variables. Grade four subjects made more PU predictions than those in grade six and the less proficient readers made more than the proficient. Only very small proportions of the predictions of the proficient grade six readers were plausible but unlikely. It is possible that with a wider range of stories and larger numbers of PU predictions, differences might be significant.

The data related to this variable point to the conclusion that these less desirable predictions resulted from the subjects' difficulty in knowing where to focus and in recognizing the significance of particular items of information. The difficulty appeared to originate in the thinking processes of the younger and less proficient readers. The subjects making PU predictions were not skilled in evaluating incoming information and focusing on events which were significant.

Research Question 4

Is there a difference in the number of inappropriate predictions made by proficient and less proficient readers in grades four and six when reading continuous discourse?

Hypothesis 4.0:

There is no significant difference in the number of inappropriate predictions made due to

4.1 grade

4.2 group

4.3 treatment.

Hypothesis 4.1: The number of inappropriate predictions made did not differentiate significantly between the grades. The highest scores on this variable were made by grade four subjects. Because the

difference between the grades was not significant, hypothesis 4.1 was upheld.

Hypothesis 4.2: There was not sufficient variance in the number of inappropriate predictions made to differentiate significantly between the proficient and less proficient readers in the sample. Therefore, hypothesis 4.2 was not rejected. Less proficient readers in grade four scored higher on this variable than did the proficient readers. In grade six, because of the wide difference in the total number of predictions between the two groups, the reverse was true.

Hypothesis 4.3: Because the difference in the number of inappropriate predictions made due to treatment was significant in only one set of stories, hypothesis 4.3 was not rejected. All groups made more inappropriate predictions in the probed than in the unprobed condition.

The results from the analysis of scores on this variable were very similar to those revealed by the analysis of plausible but unlikely predictions. No subject made a large number of inappropriate predictions. Greater proportions of the predictions of the less proficient grade four subjects were inappropriate than was the case for any other group. Proficient sixth graders had the smallest proportion of their predictions inappropriate. Less proficient readers generally, predicted inappropriately more frequently than did the proficient. Whereas there was an indication of the same difficulties in knowing where to focus attention as appeared in the analysis of PU predictions, inappropriate predictions resulted from an added problem of lack of comprehension of the events involved. Subjects were more likely to predict inappropriately when probed than when they read independently and were free to respond at

will.

Predicting inappropriately related negatively to comprehending in this investigation. This significant negative relationship appeared not only with the comprehension scores on the stories involved in the study but also with comprehension generally, as measured by the Canadian Tests of Basic Skills. Although in the analysis, the differences in the number of inappropriate predictions given by proficient and less proficient readers did not generally reach the level of significance, there is evidence to support a conclusion that inappropriate predictions tend to characterize the less mature and less proficient readers, particularly when these subjects are probed.

Research Question 5

- a) Is there a difference in the extent to which proficient and less proficient readers in grades four and six support the responses they make when reading continuous discourse?
- b) Do proficient and less proficient readers in grades four and six base their predictions on clues drawn from the same sources when reading continuous discourse?

Hypothesis 5.0:

There is no significant difference in the number of supported responses due to

5.1 grade

5.2 group

5.3 treatment.

Hypothesis 5.1: Although the differences in the number of supported responses due to grade were not significant, there was a tendency for the grade six subjects to support more of their responses than did the fourth graders. Based on this evidence, hypothesis 5.1 was not rejected. Differences between the grades were minimal in the probed condition. There was much wider variation between the grades in the pro-

portions of responses supported when subjects read independently.

Hypothesis 5.2: Since the difference in the number of supported responses due to group reached the level of significance in only one set of stories, hypothesis 5.2 was not rejected. In both grades the proficient readers supported greater proportions of their responses than did the less proficient.

Hypothesis 5.3: Because significant differences in the number of supported responses due to treatment were revealed in only one set of stories, hypothesis 5.3 was upheld. Both proficient and less proficient readers supported greater proportions of their responses in the probed than in the unprobed condition.

When raw scores on the number of supported responses were considered, this variable was unable to differentiate significantly between the grades, groups or treatments. However, as suggested earlier, these results must be considered in conjunction with those reported in Chapter V in which the scores were discussed as proportions of the total number of responses. Although some groups did not support a significantly higher number of responses, they did, in fact, support a higher proportion of the responses they gave in comparison to the other groups. The results of these two analyses must be combined as conclusions are drawn.

It was found that the grade six subjects were somewhat more capable than the fourth graders of giving reasons for their conclusions. Differences between the grades, although minimal in the probed condition, were wider when subjects read independently.

The difference in the tendency for proficient and less proficient readers to support a large percentage of their responses was found in

Chapter V to be significant. The proficient readers in both grades supported significantly higher proportions of their responses than did the less proficient. It was in the unprobed condition where these significant differences appeared. Table 5.46 (page 142) shows that all groups were significantly more likely to offer no support in the unprobed condition. This tendency however was even stronger in the less proficient than in the proficient readers.

It is difficult to determine the exact source of the clues which cause the readers to respond as they do. On many occasions the readers themselves were unable to identify the clues which caused them to form their conclusions. When they did identify these, differences related to treatment appeared to exist. Some tendencies, however, were noted and are discussed below.

In the probed condition, the less proficient fourth graders made more reference to the text (FS) than did the subjects of the other groups in supporting their responses. The proficient fourth graders, the group with the highest mean scores on the intelligence test, were more inclined to reason to a logical conclusion (LS) than were the members of the other groups. The grade six subjects showed somewhat greater ability than the others to make generalizations from their own experiences in support of their conclusions. Less proficient readers tended to use irrelevant material in an attempt to support their responses more frequently than did the proficient. Generally, readers from all groups gave factual and logical support, tending to rely more heavily on the text (FS) in the unprobed condition and on reasoning to a conclusion (LS) when probed. Experiential support and irrelevant

support were given more frequently in the probed than in the unprobed condition. Differences in the types of supporting evidence offered were not of sufficient magnitude to warrant a conclusion that proficient and less proficient readers consistently select different types of clues upon which to base their predictions.

Predicting in reading related positively to supporting responses. In both the probed and unprobed conditions the groups making the largest number of predictions also had the highest proportions of supported responses. The group making the fewest predictions had the lowest proportion of supported responses. A similar positive relationship was found between the tendency to support responses and the ability to predict appropriately. Supporting responses related positively to convergent and divergent thinking and appeared to characterize subjects with high scores on the intelligence and standardized reading tests.

Research Question 6

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of cognitive memory productions given in response to stories?

Hypothesis 6.0:

There is no significant difference in the number of cognitive memory productions given due to

6.1 grade

6.2 group

6.3 treatment.

Hypothesis 6.1: Because the differences due to grade in the number of cognitive memory productions (CM) made did not reach the level of significance, hypothesis 6.1 was not rejected. The grade six subjects

made more CM productions than did the fourth graders and had a higher proportion of their responses in the CM column than did the latter.

Hypothesis 6.2: The difference due to group in the number of CM productions made approached, but did not reach, the level of significance. Hypothesis 6.2, therefore, was upheld. The less proficient readers made more CM productions than did the proficient, particularly at the grade six level. Under both treatment conditions the less proficient readers had higher proportions of their responses in the CM column than did the proficient.

Hypothesis 6.3: In all stories there were significant effects due to treatment in the number of CM productions given, causing the rejection of hypothesis 6.3. CM productions were far more numerous in the unprobed than in the probed condition. All groups had higher proportions of their responses in the CM column in the unprobed than in the probed condition.

There was wide variation in the manner in which individual subjects approached the task of reading and telling their thoughts as they read. Whereas some subjects appeared to feel threatened by the task, others accepted it as an interesting game to be enjoyed. Some subjects were embarrassed when their speculations proved to be not in accord with the events in the story, whereas others laughed and reformulated their hypotheses. Some readers were unwilling to tolerate uncertainty and tried to eliminate it by proposing one right answer. Others were satisfied to propose several probable solutions. The responses of such subjects, frequently proficient readers, are replete with such expressions as, "probably", "or something", "likely" and "maybe".

Some subjects, particularly the less proficient readers in grade six, appeared to approach the selection with one thought in mind, that of being able to repeat what the author was saying. Some felt in "Moose Shooting" that it was unfair to expect them to know that the boys were shooting with a camera since the author had not stated this. In "The Most Dangerous Animal" one subject was annoyed because the name of the animal was withheld until late in the story and made the comment "Why don't they tell you what it is?" Another subject, a proficient reader, made no comments throughout the reading of an entire story, claiming that she thought nothing as she read. The fact that the less proficient readers in grade six made more CM productions than even the less proficient fourth graders raises the question of whether or not this is a learned response to stories.

The difference in the levels of thinking involved when proficient and less proficient readers responded to stories was particularly noticeable in the unprobed condition. However whether probed or not, the less proficient readers had higher percentages of their responses in the CM column than did the proficient. The proficient sixth graders made fewer CM productions than did any other group. Nearly two-thirds of all the responses of the less proficient sixth graders when reading independently were restatements of the facts of the story. Some subjects had all of their responses in this category.

It is important to note that when subjects were guided through probing by the investigator, CM productions made up a very small proportion of their responses. It appeared that less proficient readers were capable of making a wide variety of responses in a structured

situation. It is possible that with practice they may learn to respond to literature in this manner when reading independently. The scores show that as proficient readers progress through the grades the number of CM productions decreases, suggesting a developmental trend away from the recitation of events from the story.

In summary, differences in the levels of thought involved in the responses of proficient and less proficient readers were revealed in the investigation. The differences between the probed and unprobed responses were significant. The greatest difference between the two treatments was found in the responses of the less proficient readers.

Research Question 7

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of convergent productions given in response to stories?

Hypothesis 7.0:

There is no significant difference in the number of convergent productions given due to

7.1 grade

7.2 group

7.3 treatment.

Hypothesis 7.1: Since there were no significant effects due to grade in the number of convergent productions, hypothesis 7.1 was not rejected. In the probed condition, there was very little difference between the grades in the number of convergent productions. The difference in the unprobed condition was in favour of the grade six subjects.

Hypothesis 7.2: Differences due to group in the number of convergent productions were not significant; therefore, hypothesis 7.2 was not rejected. In both the probed and unprobed conditions less pro-

ficient readers had higher proportions of their responses convergent than did the proficient readers.

Hypothesis 7.3: Since in both sets of stories there were significant effects due to treatment, hypothesis 7.3 was rejected. In DA & LL the difference favoured the probed treatment and in MS & OS it favoured the unprobed condition. All groups except proficient sixth graders had higher proportions of their responses in the CP column when probed. The significance of the nature of the probe was revealed in this analysis.

Since the design of the study made provision for exploring, to some extent, responses made to structurally- varied stories, some consideration will be given to this matter in the discussion of variables seven (CP) and eight (DP). One story (DA) consisted of information-type prose and elicited a large number of convergent hypotheses in the probed condition. Unprobed responses were considered in order to examine the possibility that the nature of the story determined the nature of the response.

In the probed condition, because of the nature of the probe, subjects did indeed make more convergent responses in this story than they did in the others. However, when reading without probing, the subjects did not make a significantly higher proportion of convergent responses in this story than in the others. This observation would assign greater significance to the role of the teacher in guiding the reading than to the nature of the story in determining the levels of thought involved in the responses. Some of the groups did make higher proportions of CP responses in this story (DA), but this did not hold true for all groups. Whereas structural features of the story appeared

to influence the nature of the responses it can not be concluded that they determine the nature of response made while reading.

The analysis showed that this variable, the number of convergent productions made, did not significantly differentiate between the grades or the groups. Grade six subjects however, tended to have higher scores than the fourth graders and the less proficient readers out-scored the proficient.

Research Question 8

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of divergent productions given in response to stories?

Hypothesis 8.0:

There is no significant difference in the number of divergent productions given due to

- 8.1 grade
- 8.2 group
- 8.3 treatment.

Hypothesis 8.1:, Since there were no significant effects due to grade in the number of divergent productions made, hypothesis 8.1 was not rejected. In the probed condition there was very little difference between the grades in the number of DP responses made; however, in the unprobed condition differences, which favoured the grade six subjects, were wider.

Hypothesis 8.2: Divergent productions significantly differentiated between proficient and less proficient readers. Therefore, hypothesis 8.2 was rejected. Regardless of treatment, in both grades the differences favoured the proficient readers.

Hypothesis 8.3: Since significant differences in the number of

divergent productions due to treatment appeared in only one set of stories, hypothesis 8.3 was upheld. Where differences existed, they favoured the probed treatment. For the less proficient readers the difference in the number of divergent productions due to treatment was wide; however, the numbers given by the proficient readers differed little from one treatment to the other.

Divergent thinking has been shown in this investigation to relate positively to intelligence, comprehending, predicting appropriately and supporting responses. It has emerged as one of the competencies which characterize proficient reading. Proficient readers in this study, whether probed or not, had higher proportions of their responses in the DP column than in any of the other columns. This was not the case for the less proficient readers whose scores on divergent productions varied greatly, depending upon whether or not the probe was given. In response to the probe, all groups made many DP responses. However, without probing fewer than one-tenth of the responses of the less proficient readers were divergent. When this is compared to more than one-third of the unprobed responses of the proficient readers assigned to this category, the magnitude of the difference can be appreciated. When reading independently, the proficient sixth graders showed a greater tendency toward divergent thinking than did all the other groups. The difference between their scores in the probed and unprobed conditions was minimal. It appears that these readers have reached a sufficient level of maturity to structure their reading and to set their own purposes when reading independently.

Although there was some evidence to suggest that the tendency toward divergent thinking is story-related, this was not sufficiently

convincing to warrant a conclusion that structural features of the story determine the nature of the response. In the unprobed condition all groups except one, the less proficient fourth graders, made their highest proportions of divergent responses in "On the Spot", the story written to elicit divergent hypotheses. The differences, however, were not large. A comparison of probed and unprobed scores in the DP column for all groups suggests that probing plays a more significant role than do the structural features of the story in determining the levels of thinking involved in responding to literature. It is conceivable that the provision of ample opportunities for the pupils to engage in carefully guided reading experiences would result in further development of this type of thinking.

Research Question 9

Will the difference in the levels of thinking of proficient and less proficient readers in grades four and six result in a difference in the number of evaluative productions given in response to stories?

Hypothesis 9.0:

There is no significant difference in the number of evaluative productions given due to

- 9.1 grade
- 9.2 group
- 9.3 treatment.

Hypothesis 9.1: Since significant effects due to grade in the number of evaluative productions made were revealed in only one set of stories, hypothesis 9.1 was not rejected. Where differences were significant, they favoured the grade four subjects.

Hypothesis 9.2: Differences due to group in the number of evaluative productions made were significant in only one set of stories;

therefore, hypothesis 9.2 was not rejected. The less proficient readers made more evaluative productions than did the proficient.

Hypothesis 9.3: In both sets of stories there were significant differences due to treatment in the number of evaluative productions made; therefore, hypothesis 9.3 was rejected. All groups made more evaluative productions in the unprobed than in the probed condition. The greatest differences between the two treatments appeared in the scores of the grade four subjects.

Except when fourth graders read independently the number of EP responses was small. Proficient readers, when probed, made no evaluative productions. The highest scores were assigned to the less proficient fourth graders in the unprobed condition. It would be unwise to generalize from the results of the analysis of the scores on this variable because of the pattern of the responses involved. The analysis did reveal a tendency to make more evaluative productions in the unprobed than in the probed condition. Grade four subjects appeared to be influenced by probing to a greater extent than were the sixth graders.

A consideration of the levels of thought involvement indicated in the responses of the proficient and less proficient readers of grades four and six revealed differences in the manner in which these subjects responded to print. The analysis of variables six to nine indicated that the differences between the grades in the thought processes employed were not so striking as the differences due to proficiency levels. Only one of these variables, evaluative productions, resulted in significant differences due to grade, in at least some of the stories. For two of the four variables which examined the thought processes,

divergent productions and evaluative productions, the analysis revealed, in at least some of the stories, significant effects due to the proficiency level of the readers. For all four of the variables the analysis revealed significant effects due to treatment. Probing was very effective in stimulating the higher levels of thinking in response to stories. Unfortunately, too few of the subjects in the sample appeared to operate on these same levels when reading independently. Instead, some perceived the task as one of restatement of the events of the stories.

An important feature of this analysis was the information gained concerning the difference in the thought processes involved as proficient and less proficient readers responded on a variety of levels when reading independently. Implications of this finding for the teaching of reading to both proficient and less proficient readers will be made in the next section.

Research Question 10

On a test of comprehension based on the stories read, is there a difference in the scores of the proficient and less proficient readers in grades four and six?

Hypothesis 10.0:

There is no significant difference in the scores on a comprehension test due to

10.1 grade

10.2 group

10.3 treatment.

Hypothesis 10.1: Since the difference in comprehension scores due to grade was significant in only one set of stories, hypothesis 10.1 was not rejected. Where differences existed, they favoured the grade six subjects.

Hypothesis 10.2: In both sets of stories there was a significant difference in comprehension scores due to group; therefore, hypothesis 10.2 was rejected. In both the probed and unprobed conditions proficient readers scored higher than the less proficient. The difference between the scores of the two groups was greater in the unprobed than in the probed condition.

Hypothesis 10.3: Since difference in comprehension scores due to treatment was not significant, hypothesis 10.3 was upheld. Differences, though modest, favoured the probed condition for less proficient readers and the unprobed condition for proficient readers.

As expected, the grade six subjects had higher scores on the comprehension tests than did the fourth graders. However, proficient readers in grade four scored higher than the less proficient readers in grade six and almost as high as the proficient sixth graders. It appears that the comprehension tests were not of a sufficient level of difficulty to differentiate between proficient readers at these levels. It should be remembered that the readability of the stories was at an early fourth grade level. It is possible that a more challenging test may have revealed differences due to treatment. The greatest difference in comprehension between proficient and less proficient readers was found in grade four.

The qualitative analysis revealed a relationship between prediction and comprehension. The item-analysis of the multiple choice tests showed that subjects who failed to anticipate coming events when reading the stories often missed on the comprehension test the items which referred to these events . (See Table 5.9, page 155). Conversely

predicting appropriately appeared to assist the readers in focusing on significant events as they occurred. The earlier in the story the prediction was made, the earlier the reader became alert to significant facts related to the outcome of the story.

The data clearly showed that the subject's comprehension of the story was influenced by both the frequency and the nature of the predictions he made. On the other hand, there is support for the conclusion that the subject's comprehension of the story influenced the nature of his predictions. Subjects in the sample who did not understand or who misinterpreted some of the information presented often made inappropriate predictions which caused them further to confuse significant details in the remaining portion of the story. The responses of the less proficient readers in particular contained many examples of this cyclical effect of faulty comprehension causing inappropriate predictions which, in turn, caused additional difficulties in interpreting the remainder of the story. The significance of the role of prediction in reading comprehension has implications for reading theory.

Research Question 11

Are there patterns of responses which characterize proficient and less proficient readers in grades four and six when responding to stories?

Both the statistical analysis (Chapter IV) and the qualitative analysis (Chapter V) revealed patterns in the responses of proficient and less proficient readers characterizing the members of each group. The proficient readers in the sample predicted more frequently than did the less proficient. (Table 5.1, page 123.) They were more capable of setting their own reading purposes when reading independently. Generally,

this group predicted more appropriately than did the less proficient readers who often made plausible but unlikely or inappropriate predictions.

The proficient readers in the sample were characterized by the ability to support their conclusions. They were unlikely to offer irrelevant support as frequently as did the less proficient readers who, generally, were reluctant to support conclusions, particularly when reading independently.

When the patterns of thought involved in the responses were considered, it was found that proficient readers were more divergent in their thinking whereas the less proficient were preoccupied with the restatement of the text. The former were more competent in reassessing their previous hypotheses as conflicting information was received. They were characterized by a degree of flexibility in reading which the less proficient readers did not seem to possess. The difficulty of the latter in selecting significant information upon which to focus often caused them to misinterpret the text.

To summarize, proficient readers in the sample were characterized by a tendency to predict, to predict appropriately, to support responses, to think divergently and to make high scores on comprehension tests. The less proficient readers were found to predict less frequently, to make more plausible but unlikely or inappropriate predictions, to be less inclined to offer supporting evidence, to give more restatements of the text and to have lower comprehension scores than the proficient. The better readers were more willing to interact with the ideas in the passage and to anticipate the information that would be presented.

When patterns of responses for proficient readers were compared across grades, the developmental nature of the predictive process was indicated. A comparison of the responses of the less proficient subjects in grades four and six suggested that these readers assumed a more passive role in reading as they moved through the grades. The response patterns of the proficient fourth graders resembled that of the proficient sixth graders more closely than it did the pattern of the less proficient readers in that grade. The analyses showed that although individual differences existed within the reading groups, there were patterns of responses which characterized proficient and less proficient readers.

Research Question 12

Is there a relationship between the number and kinds of predictions given and the structure and content of the stories read?

It was shown in Chapter III that structurally-varied stories were constructed in order to assess the influence of the organizational pattern of the selections upon the predictive process in reading. Chapter V presented the findings from the individual stories and discussed differences in the responses based on the sex of the respondents. It was suggested that whereas the structural features of the selections had an influence upon prediction in reading, many other factors were operating simultaneously, each contributing to the nature of the subjects' responses, thus making it impossible to assign a directive role to the structural features of the selections. Individual learning styles, the subjects' language and experiential backgrounds and other

affective factors influenced the predictive process.

The analyses showed that the complexity of the stories influenced the nature of the responses. The longest, most complex story, the narrative selection incorporating the problem-solving element, elicited the largest number of responses. The boys, in particular, appeared to enjoy the element of danger introduced in this selection (OS), which was the one accounting for the largest number of predictions given. Subjects were more likely to offer supporting evidence for their responses to this passage than to any of the others. The problem-solving element appeared to challenge the readers, to arouse and to hold their interest. The simple narrative selection emphasizing temporal sequencing (MS) was not as successful as the other three stories in generating active participation on the part of the readers. Fewer predictions were given in this story than in any of the others.

The stories designed to elicit divergent and convergent hypotheses did, in fact, accomplish this purpose; however, it was shown that since this occurred to a far greater extent with probing than in the unprobed condition, it was the nature of the probe rather than the structure of the story which was assigned the role of directing the response.

Although the content of the story appeared to affect both the frequency and the nature of the predictions, it could not be shown that the sex of the main character initiated active participation by readers of the same sex. Whereas the boys were more responsive than the girls to the story (MS) with boys as the main characters, boys also made more responses to the story (OS) about Nancy Vincent. Features other than the sex of the main character influenced the verbal fluency

of the respondents. There was some indication that this feature was related more closely to comprehension and the number of predictions given than it was to the verbal fluency of the subjects. Whereas girls had higher comprehension scores and made more predictions than the boys in response to DA and OS, the boys had better comprehension of LL and MS.

The findings from both the qualitative and statistical analyses revealed that both the frequency and the quality of the predictions made were influenced by the structure and content of the selections presented. The role of the teacher in determining the nature of the reader's response to stories was shown to be crucial.

Implications of the Study

The process of prediction in reading was investigated by observing readers as they responded to stories. From the observation and from the analysis of the subjects' responses conclusions were reached regarding the role of prediction in reading. Implications from the study for reading theory, for the teaching of reading and for those involved in reading research will be discussed in this section.

An understanding of the predictive process is essential in the formulation of reading theory because ideational prediction appears to be able to differentiate between proficient and less proficient readers. Integrative research, which has enriched reading theory and directed attention to the processes involved in comprehension has also stimulated an interest in the nature of prediction in reading. The reasoning nature of reading which has been emphasized throughout this investigation strongly indicates the fruitfulness of further study of prediction in

reading through the exploration of the cognitive operations involved in the various phases of comprehension. The nature of the predictive process can be understood only through a clearer definition of the underlying thinking processes which enable the reader to formulate hypotheses which go beyond the information given. This study has provided evidence of differences in the thought processes of proficient and less proficient readers as they respond to stories. It has shown also that there are differences in the operations employed in independent and in guided reading which are greater for some readers than for others. Further exploration of these differences surely would make a contribution to reading theory. A cognitive-oriented approach to the study of ideational prediction may clarify such matters as the influence of learning styles, prior training, certain affective factors and of past experience in determining the nature of the predictions made.

The proficient readers in the sample were more divergent in their thinking than were the less proficient, whose recitation of facts from the story comprised the major portion of their reactions to the reading material. This finding upheld one of the basic assumptions of the study and confirmed the hypothesis of Stauffer (1961) that if skilled and unskilled readers are stopped in the middle of a story and asked about events to come, the responses of the former will be far more divergent. The less proficient readers in the sample were more passive in their approach to the stories. Their conscious involvement with the ideas in the passage was limited. These differences in the approach to literature must be recognized in a theory of prediction which encompasses various degrees of proficiency on the part of the readers. Be-

cause two of the readers in the sample made no predictions when reading independently, the need for further exploration of Smith's claim that all readers predict naturally and without training is indicated.

The relationship which was revealed between predicting appropriately and comprehending raised further questions concerning the relationship of both of these to intelligence and to the ability of the reader to support the conclusions he has reached. Predicting in independent reading was shown to be closely related to the ability to offer supporting evidence. A theory of ideational prediction must clarify the role of supporting evidence and encompass all of these interrelated processes. A more precise classification of the categories of supporting evidence than that used in this study may assist in this clarification and supplement reading theory.

Evidence for the reality of the developmental nature of the predictive process has been supplied. Emerging patterns of behavior of proficient readers showed that the responses of the grade four subjects resemble, but do not equal, those of the more mature grade six subjects. Although the differences between the grades were not always significant, a comparison of the scores on most of the variables showed proficient grade six readers operating at slightly higher levels of efficiency than were the proficient readers in grade four. The differences suggested by Piaget (Inhelder and Piaget, 1958) in the ability of children at these levels to operate in the realm of the probable were verified by the data. Some of the younger and less proficient readers in the sample appeared to have a backward-looking approach as they

read and to be preoccupied with the memorization of facts, whereas the proficient readers concentrated upon setting up possible solutions to the problems confronting the characters in the stories.

The significance of the role of questioning in encouraging flexibility and depth of thinking was confirmed by the investigation. Guszak's claim that the reader adapts his approach to the type of questions he anticipates receiving was supported. The tendency toward cognitive memory productions on the part of the less proficient readers caused some speculation concerning the type of questions they are accustomed to receiving when discussing the material they have read. The significance of the role of questioning in the elevation of the thought processes involved in response to literature needs to be emphasized not only by those who formulate a theory of prediction but also by those charged with the responsibility of training teachers for the classroom.

The investigation has provided support for the hypothesis - test model of reading and has supplied evidence to show that the model applies not only on the level of words and sentences but also on the ideational level. A reader who has predicted an event or an ending needs only to confirm his hypotheses from the visual array. In this way reading becomes more of a cognitive and a less visual process. With this view of reading in mind, both theorists and teacher educators should recognize the requirements of a realistic division of attention between comprehension and word identification and see the value of an approach to word identification through meaning. Such a view would not disregard the significance of the level of oral language development in the reader and of other affective factors which are operating. The cognitive-oriented theory of prediction suggested will result in practices designed

to develop readers who are not only skilled in word identification but who critically evaluate what they have read.

Teachers of reading should note that the findings of this study have stressed the language-thinking nature of reading. The importance of the language background of the child in formulating hypotheses based on his knowledge of syntax suggests the wisdom in using materials written in the familiar oral language patterns of the reader. Because the child brings to the reading situation his ability to process language, his knowledge of syntax would facilitate the predictive process because of the familiar patterns. The use of meaningful exciting stories would help the reader to predict from meaning.

It was found that readers who had reached a sufficient level of maturity and reading proficiency predicted almost as frequently when reading independently as they did when their reading was guided by questions from the investigator. The fact that several proficient readers, when interviewed, indicated a dislike for reading in school and a preference for reading at home suggests that these subjects may consider the guiding done by the teacher somewhat of a nuisance. Several subjects appeared to be annoyed when they were asked to stop at the end of each section of the story. Since these readers were capable of setting their own purposes as they read, the provision of greater opportunity for independent reading is recommended. Although the differences were not large, proficient readers in this sample scored higher on comprehension tests when they read stories independently, rather than with probing.

Since the study showed that all readers were capable of predicting when probed but that not all readers predicted when reading independently, the implication is that some readers require far more structuring

in the form of questions from the teacher than others. Some of the less proficient readers in the sample required the stimulation provided by the questions in order to initiate speculation. The need for the teacher to consider the idiosyncracies of the reader and to provide diagnostic teaching based on knowledge of the child's ability to reason and to evaluate what he reads was identified. Small group and whole group experiences in which the children are encouraged to speculate while reading and to justify their speculations would allow the unskilled to explore the reasoning processes of the skilled and to learn to select pertinent facts upon which to base their predictions. Attention to reasoning in group situations may assist the reader in transferring group strategies to his independent reading.

With less proficient readers, in particular, oral language experiences can assist in the development of the predictive process. The teacher may choose to read to the children and have them predict at certain exciting points throughout the story and encourage them, in this manner, to interact with the information through listening experiences. In this way the children would learn to speculate, to select information and to justify their conclusions without the added burden of word identification. When their responses were compared with the actual events in the remaining portion of the story, the pupils could examine such aspects as plausibility and likelihood of occurrence. Oral exercises also could assist in the development of favourable attitudes toward speculation. Children who are reluctant to predict would learn to be more venturesome and to lose their fear of making a mistake. Since the findings revealed that many subjects overlooked significant information and focused on unimportant events, the group exercises recommended

would help readers learn to focus their attention upon pertinent information as a basis for predicting. The use of simple seeing-thinking activities (Valmont, 1977) could assist the teacher in establishing predictive behaviors at any grade level. The fact that the predictive strategies of the less proficient readers in the sample appeared to have deteriorated rather than improved as they moved through the grades suggests the need for early attention to these strategies.

A relationship was revealed between predicting in reading and the ability to offer supporting evidence for conclusions. In view of this, classroom activities designed to encourage children to evaluate their predictions and to justify their hypotheses are recommended as a worthwhile procedure. The subjects in the sample who supported the highest proportion of their responses were the ones who made the largest number of predictions. The practice of predicting, selecting and verifying can be incorporated into classroom activities from the very early stages of reading readiness.

The identification of the crucial role played by the teacher as the one who initiates and determines the thought processes involved in response to literature has implications for questioning procedures within the classroom. Although the gleaning of facts from the reading passages is an important aspect of comprehension, the teacher must realize that this is only one step in the process and that higher reasoning powers must be called into service if the child is to learn to read critically. The segmentation of stories in the manner in which the passages in this study were divided should be a useful device in helping children to predict and to read critically. If teachers pose provocative,

higher-level questions the children will respond on these levels and anticipate further questioning on these higher levels even when reading independently. The categories used in the investigation to analyze responses according to the thought processes involved may be a useful guide to the teacher as she formulates questions.

The item analysis of the comprehension tests showed that predicting clearly aids comprehension. In addition, when individual items on the tests were considered in conjunction with the predictions the subjects had made, information was provided concerning the reasoning processes of the readers. The diagnostic value of such an approach is recognized in view of the relationship which exists between prediction and comprehension. Information gained from the scores on daily comprehension exercises should be supplemented by insight gained through item analysis in order to illuminate the reasoning processes underlying the selection of particular responses. Teachers would benefit also by investigating in this manner the influence of questioning on the comprehension scores of individuals within the group.

The importance of conveying to prospective teachers the concept of reading as a reasoning process needs to be stressed. Training institutions in preparing teachers to direct reading instruction should give particular attention to the inquiry process in reading. The development of an attitude which encourages them to require their students to think critically about the material they read is essential.

It was shown in Chapter III that at least some of the curriculum materials available to classroom teachers assign significance to the predictive process. Unfortunately, much of the reading material avail-

able for use in the classroom, because of such features as rigid vocabulary control and the suggestions for story introductions in the teachers' manuals, in practice discourage speculation. The provision of curriculum materials containing interesting stories with thought-provoking titles and pictures which encourage readers to speculate would assist the classroom teacher in developing critical readers. Manuals which direct the teacher to permit children to set their own reading purposes, to hypothesize and to verify would be an asset. Materials could be written which deliberately withhold information in order to allow for speculation. Such materials would encourage an interactive approach to reading, an experience in which the teacher listens to the hypotheses of the readers and guides them through an evaluation of their reasoning processes.

The importance of the provision of materials written in the familiar oral language patterns of the children already has been suggested. Curriculum materials which enable the reader to make full use of his accumulated syntactic and semantic knowledge are conducive to prediction. The provision of an ample supply of trade books through which teachers can nurture the inquiry process is essential.

Suggestions for Further Research

The study explored the nature of the cognitive processes involved in prediction in reading. Whereas the investigation has shed light upon some aspects of the predictive process it has, in turn, raised additional questions which require answers. It has shown that readers in grades four and six were able to select clues from the pas-

sages and to speculate concerning the events in the remaining portion of the story. Yet many questions about prediction in reading remain to be answered. These will be discussed below along with suggestions for future research designed to illuminate various areas of prediction.

There is a need for additional studies to determine whether the predictive process in subjects in grades four and six generally resembles that of the thirty-two subjects in this sample. The variation in the responses from subject to subject in some of the groups was wide. Exploratory studies of prediction in similar groups of subjects by other researchers would help to determine how general is the applicability of the results of this study.

At each of the four proficiency levels involved in this investigation eight subjects participated. Future investigators should repeat this study using larger numbers of subjects in each of the groups. It is possible that differences which appeared but were not significant, may reach the level of significance if groups were larger.

The emergence of patterns of responses which characterize proficient and less proficient readers was an important feature of this investigation. When the patterns for proficient readers were compared across grades the developmental nature of the predictive process was indicated. The patterns of responses for proficient fourth graders resembled but did not equal the response patterns of the proficient sixth graders. Additional research is needed to determine whether similar relationships are revealed in response patterns of proficient readers at other grade levels. When the patterns were compared across grades for less proficient readers, it appeared as though the older subjects

regressed rather than progressed as they passed through the grades. Certainly this finding is of sufficient importance to deserve further attention. Studies similar to this one could provide further verification at the grades four and six levels as well as examine this phenomenon at other grade levels.

Two of the less proficient readers in this sample made no predictions when reading independently. Additional research with readers of low proficiency could help to determine whether this is a common occurrence or if the behavior of these subjects was unique. It is possible that these readers failed only to report their predictions. Subjects who scored below the grade 3.5 level on the Canadian Tests of Basic Skills were excluded from this investigation. There are then readers in grades four and six classrooms who are having greater difficulty than those classed as less proficient in this sample. Future research could investigate the process of prediction in these readers by using a method similar to that used in this study but being careful to provide stimulus materials that are much less complex. A simple paragraph in which the reader predicts from the title and later predicts the outcome of the story may be appropriate. An examination of the thoughts reported during the reading of such paragraphs could provide information concerning the frequency of prediction in independent reading. It is possible that readers of low proficiency may predict more frequently in oral than in silent reading. This aspect needs exploration. Some of the less verbal subjects may be more comfortable acting out their predictions rather than reporting them. Predicting from pictures rather than from stories might help to determine whether the subjects' difficulties originate

in the thinking process or in the mechanics of reading.

Subjects who had not had extensive training in the DR-TA approach to reading were considered appropriate for this investigation of the predictive process. A similar study using subjects who have had considerable experience with this approach would assist in the evaluation of certain teaching procedures as well as provide further information concerning the cognitive operations involved in prediction. This research should examine the process at various grade levels in order to determine the effectiveness of the procedures at different stages of reading development.

There was wide variation in the responses of the individual subjects within the groups. Indications were that individual learning styles and other affective factors were at work. The fact that the less proficient readers in grade six understood the selections better (Table 5.8, page 151) but did not predict as frequently (Table 5.1, page 123) as the less proficient fourth graders suggests that they may have been influenced by other factors such as poor self-concept or fear of failure. Subjects who, in the initial interview, indicated a dislike for taking risks or those who felt that the teacher disapproved of guessing were found to lack venturesomeness in their approach to the selections. They appeared to be unwilling to predict until they had sufficient information to ensure success. These same subjects were embarrassed when they predicted inaccurately. Future research relating prediction in reading to individual learning styles and certain personality variables should make a contribution to the field. A comparison of the performances on some of the variables identified in this study by subjects classified accord-

ing to learning styles and personality traits should yield valuable information about the idiosyncratic nature of prediction in reading. The use of materials in which the subjects were given only a portion of a story for which they were asked to provide an ending may eliminate their preoccupation with supplying the "correct" answer. They may be less reluctant to predict if the fear of making a mistake were removed. The writing of alternative endings for stories is another method that might be used.

The tendency for readers to fill in gaps in information subjectively offers an exciting area of study. A variation of the cloze procedure in which the reader supplies ideas rather than single words could be a means of exploration of ideational prediction.

Observations of the behavior of the thirty-two subjects as they read indicated that reading was a less visual process for some than for others. It is hypothesized that substantial differences would be revealed through the use of the reading eye camera to compare the eye movements of readers who had predicted accurately, those who had predicted inaccurately and those who had failed to make any predictions. Further research is required to explicate the differences in the strategies which might be revealed. Smith's (1975) claim that because the reader predicts what will happen next he need not decode surface structure exhaustively may, in fact, be verified.

The present study examined the process of prediction in silent reading. A similar study in which the subjects read orally would permit a comparison of predictive strategies in the two situations. It is possible that the use of written responses rather than the oral mode of response which was used in this study might produce interesting results.

Some subjects may show a greater willingness to respond in a situation in which the audience is more remote. Tape recording the responses outside the presence of the investigator may appeal to some readers.

Although the item analysis of the comprehension tests yielded valuable information, it was felt that if the comprehension tests had been more challenging, still more would have been revealed concerning the relationship between comprehension and prediction. Passages designed to be read by both less proficient fourth graders and proficient readers in grade six could not exceed an early fourth grade readability level. It was difficult to construct a test based on this material that would challenge proficient sixth graders. A study examining the process in proficient readers only could use more challenging materials and supplement the information gained from this study concerning the relationship between prediction and comprehension. The fact that there was not sufficient variation in the scores of the proficient readers in grades four and six may have obscured some of the effects of probing and purpose setting on comprehension. A further study using materials of different readability levels but of the same content for proficient and less proficient readers may add to the knowledge in this area.

It remains for future research to find the effect on the performance of the reader of the difficulty level of the material. For example, it is not known whether the proficient sixth graders in this sample would have predicted as frequently if they had been reading selections that were more challenging for them. On the other hand, would the less proficient fourth graders have predicted to the same

extent if the materials had been written at a second grade level?

Many such questions arise from the results of the present study.

Since the study was an initial exploration of the predictive process in reading it did not attempt to control rigidly the structural variables which appear to combine with certain content features to influence the process. It did however, vary the organizational patterns of the stories in order to get some indication of the importance of these variables. The results of the analysis pointed to story-related differences. For example, an exciting danger-filled selection elicited more predictions than did those selections lacking the problem-solving element. Additional research using passages, the structure and content of which are clearly defined and controlled, would shed light on this aspect of prediction.

Because of the unique relationship between oral language behavior and reading behavior, the investigator is convinced that much information concerning prediction in reading can be gained through increased attention to the significance of anticipatory behavior in oral language activities. In-depth studies in which the performance of subjects in predicting in oral situations is compared with their predicting in reading would add to our knowledge of the predictive process. In the oral situation such activities as the examination of pictures, listening to sentences and to short stories could serve to initiate prediction. This investigation has been concerned with the predictive process in reading. Suggestions have been made for classroom teachers to encourage speculation through listening experiences. An investigation of this relationship would be a fruitful and exciting area of research.

Concluding Statement

An explication of prediction in reading has been provided through an exploration of the cognitive operations involved in response to stories. This approach, suggested by the reasoning nature of reading, identified patterns of responses which characterize proficient and less proficient readers.

Whereas the study has focused upon prediction as an aspect reading comprehension, recognition is given to the fact that prediction permeates the entire reading process. Whether the reader seeks to identify unfamiliar words or to supply required information, the hypothesis - test model is called into service.

Although group patterns were identified, individual differences within the groups showed varying degrees of ability to read beyond the lines. It is these individual differences toward which classroom teaching must be directed. The diagnostic teacher, who is aware of the developmental nature of the reasoning process and of its relationship to prediction in reading, will accommodate these differences within the group as opportunities are provided for critical reading.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Allen, P. A. A Psycholinguistic Analysis of the Substitution of Miscues of Selected Oral Readers in Grades 3, 4 and 6, and the Relationships of These Miscues to Reading Process, a Descriptive Study. Unpublished Doctoral Dissertation, Wayne State University, 1969.
- Ames, W. C. A Study of the Process By Which Readers Determine Meaning Through the Use of Verbal Context. Unpublished Doctoral Dissertation, University of Missouri, 1965.
- Artley, A. S. Oral Language Growth and Reading Ability. Elementary School Journal, LII: 6, 1953.
- Ausubel, D. P. Educational Psychology: A Cognitive View. New York: Holt, Rinehart & Winston, Inc., 1968.
- Bartlett, F. Remembering. London: Cambridge University Press, 1932.
- Betts, E. A. Foundations of Reading Instruction. New York: American Book, 1946.
- Bloom, B. S., & Broder, L. G. Problem-solving Processes of College Students: An Exploratory Investigation. Chicago, Ill.: University of Chicago Press, 1950.
- Broadbent, D. E. Perception and Communication. London: Pergamon Press, 1958.
- Bruner, J. S. Personality Dynamics and the Process of Perceiving. In R. R. Blake and G. V. Ramsey (Eds.), Perception: An Approach To Personality. New York: Ronald Press, 1951, 121-147.
- Bruner, J. S. The Course of Cognitive Growth. American Psychologist, 19, 1964, 1-15.
- Bruner, J. S. On Going Beyond the Information Given. In R. Harper, et al. The Cognitive Processes. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964.
- Bruner, J. S. & Goodman, C. C. Value and Need As Organizing Factors in Perception. Journal of Abnormal Social Psychology, 42, 1947.
- Bruner, J. S., Goodnow, J. J. & Austin, G. A. A Study of Thinking. New York: Science Editions, Inc., 1956.
- Bruner, J. S., Miller, J. A. & Zimmerman, C. Discriminative Skill and Discriminative Matching in Perceptual Recognition. Journal of Experimental Psychology, 49, 1955, 187-192.

- Bruner, J. S. & Postman, L. Emotional Selectivity in Perception and Reaction. Journal of Personality, 16: 69, 1947.
- Buswell, G. T. & Kersh, B. Y. Patterns of Thinking in Solving Problems. Berkley, California: University of Californiz Press, 1956.
- Dale, E. The Reading of Magazines. The News Letter, XX, 1, Columbus, Ohio: Ohio State University, 1954.
- Duncker, K. On Problem-solving. Translated by L. S. Lees. Psychological Monograph, Vol. LVIII, No. 5. Washington, D.C.: American Psychological Association, 1945.
- Elkind, D. Cognitive Development in Reading. In H. Singer & R. Ruddell (Eds.) Theoretical Models and Processes of Reading, Newark, Delaware: International Reading Association, 1976.
- Feifel, H. & Lorge, I. Qualitative Differences in the Vocabulary Responses of Children. Journal of Educational Psychology, 41, 1950, 1-18.
- Ferguson, G. Statistical Analysis in Psychology and Education. New York: McGraw-Hill Book Company, 1976.
- Gallagher, J. Expressive Thought by Gifted Children in the Classroom. Elementary English, 42, 1965, 559-568.
- Gallagher, J., Aschner, M. & Jenne, W. Productive Thinking of Gifted Children in Classroom Interaction. Washington: National Education Association, 1967.
- Gans, Roma. A Study of Critical Reading Comprehension in the Intermediate Grades. New York: Teachers College, Columbia University, 1940.
- Geyer, J. J. & Kolers, P. O. Reading as Information Processing. In M. J. Voigt, (Ed.), Advances in Librarianship (Vol. 4). New York: Academic Press, 1974, 175-237.
- Gibson, E. J. Principles of Perceptual Learning and Development. New York: Appleton-Century-Crofts, 1969.
- Gibson, E. J., Osser, H. & Pick, A. A Study in the Development of Grapheme-phoneme Correspondences. Journal of Verbal Learning and Verbal Behavior, 2, 1963, 142-146.
- Goodman, K. S. A Linguistic Study of Cues and Miscues in Reading. Elementary English, 42, 1965, 639-643.
- Goodman, K. S. The Psycholinguistic Nature of the Reading Process. Detroit: Wayne State University Press, 1967.

- Goodman, K. S. Reading: A Psycholinguistic Guessing Game. In Harry Singer and Robert Ruddell (Eds.), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970.
- Goodman, K. S. Influences of the Visual Peripheral Field in Reading. Research in the Teaching of English, 9, 1975, 210-222.
- Goodman, K. S. & Burke, C. Study of Children's Behavior While Reading Orally. (Report of Project No. 5425), U.S. Department of Health, Education and Welfare, 1968.
- Goodman, Y. A Psycholinguistic Description of Observed Oral Reading Phenomena in Selected Beginning Readers. Unpublished Doctoral Dissertation, Wayne State University, 1967.
- Gray, W. S. Major Aspects of Reading. In H. M. Robinson (Ed.) Sequential Development of Reading Abilities (Supplemental Educational Monograph, No. 90) Chicago: University of Chicago Press, 1960, 8-24.
- Guilford, J. P. Three Faces of Intellect. American Psychologist, 14, 1959, 469-479.
- Guszk, F. Teacher Questioning and Reading. Reading Teacher, 21, 1967, 227-234.
- Hochberg, J. & Brooks, V. Reading as an Intentional Behavior. In H. Singer & R. Ruddell: Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970.
- Horn, E. Language and Meaning. The Psychology of Learning, Forty-first Yearbook of the National Society for the Study of Education, Chicago: University of Chicago Press, 1942.
- Huey, E. B. The Psychology and Pedagogy of Reading. New York: The Macmillan Co., 1908.
- Inglis, D. I. The Relationship Between the Use of Experiential Knowledge in Predicting Meaning and Reading Achievement of Fourth Grade Students. Unpublished M.A. Thesis, Department of Elementary Education, University of Alberta, 1974.
- Inhelder, Barbel & Piaget, J. The Growth of Logical Thinking from Childhood to Adolescence. New York: Basic Books, 1958.
- Jenkinson, M. D. Selected Processes and Difficulties in Reading Comprehension. Unpublished Doctoral Dissertation, Department of Education, University of Chicago, 1957.

- Jenkinson, M. D. Laying the Foundation for a Critical Reading Program. In M. Dawson (Ed.), Developing Comprehension Including Critical Reading. Newark, Delaware: International Reading Association, 1968.
- Judd, C. H. & Buswell, G. T. Silent Reading: A Study of Various Types. Supplemental Educational Monographs, No. 23, Chicago, University of Chicago Press, 1922.
- Kagan, Jerome & Moss, H. A. Psychological Significance of Conceptualization. In J. Wright and J. Kagan (Eds.) Basic Cognitive Processes in Children. Monographs of the Society for Research in Child Development, XXVIII, 2 (1963), 73-112.
- Kagan, J. Reflection - Impulsivity and Reading Ability in Primary Grade Children. Child Development, 36, 1965, 609-628.
- Koenke, L. Another Practical Note on Readability Formulas. Journal of Reading, 15 (3), 1971, 203-208.
- Laing, W. W. An Exploratory Study of the Ways Readers in Grades 4, 6 and 8 Process Context to Obtain Word Meaning. Unpublished Doctoral Dissertation. Department of Elementary Education, University of Alberta, 1974.
- Letton, M. C. Individual Differences in Interpretive Responses in Reading Poetry at the Ninth Grade Level. Unpublished Doctoral Dissertation, Department of Education, University of Chicago, 1958.
- Loban, W. D. Adolescents of Varying Sensitivity and Their Responses to Literature Intended to Evoke Sympathy. Unpublished Doctoral Dissertation, University of Minnesota, 1949.
- Maier, H. W. Three Theories of Child Development. New York: Harper & Row, Publishers, 1965.
- McCaul, R. The Effect of Attitudes Upon Reading Interpretations. Journal of Educational Research, 37, 1944, 451-457.
- McCullough, C. M. Learning to Use Context Clues. Elementary English Review, 20, 1943, 140-143.
- McKillop, A. The Relationship Between the Reader's Attitude and Certain Types of Reading Response. New York: Bureau of Publications, Teachers College, Columbia University, 1952.
- Meckel, H. C. An Exploratory Study of the Responses of Adolescent Pupils to Situations in a Novel. Unpublished Doctoral Dissertation, University of Chicago, 1946.

- Miller, G. A., Bruner, J. S. & Postman, L. Familiarity of Letter Sequences and Tachistoscopic Identification. Journal of General Psychology, 50, 1954, 129-139.
- Neisser, U. Cognitive Psychology. New York: Appleton-Century-Crofts, 1967.
- Neisser, U. The Multiplicity of Thought. In P. C. Wason and P. N. Johnson-Laird (Eds.) Thinking and Reasoning. Baltimore: Penguin Books, 1968.
- Petre, R. M. Quantity, Quality and Variety of Pupil Responses During an Open-Communication Structured Group Directed Reading-Thinking Activity and a Closed-Communication Structure Group Directed Reading Activity. Unpublished Doctoral Dissertation, University of Delaware, 1970.
- Piaget, Jean The Origins of Intelligence in Children. New York: International Universities Press, 1952.
- Piaget, Jean The Language and Thought of the Child. Cleveland: The World Publishing Company, 1955.
- Piaget, Jean Six Psychological Studies (edited by D. Elkind). New York: Vintage Books, 1967.
- Piekarz, J. A. Individual Differences in Interpretive Responses in Reading. Unpublished Doctoral Dissertation, Department of Education, University of Chicago, 1954.
- Quick, E. J. Reading Progress Book. In Jean Bailey (Ed.) Young Canada Reader - 4. Toronto: Thomas Nelson & Sons (Can) Ltd., 1961.
- Rawson, H. Piaget's Concept of Logical Development and Its Relation to Comprehension in Reading. Unpublished Doctoral Dissertation, University of Alberta, 1969.
- Ruddell, R. B. Reading-Language Instruction: Innovative Practices. Englewood Cliffs, N. J.: Prentice Hall, 1974.
- Russell, D. H. Some Research on the Impact of Reading. English Journal, XLVII, 1958, 398-413.
- Russell, D. H. Research on the Processes of Thinking with Some Applications to Reading. In Stauffer, Russell (Ed.) Language and the Higher Thought Processes. Champaign, Illinois: National Council of Teachers of English, 1965.
- Scheffé, H. The Analysis of Variance. New York: John Wiley and Sons, Inc., 1959.

- Simons, H. D. Reading Comprehension: The Need for a New Perspective. Reading Research Quarterly, 6: 3, 1972, 338-363.
- Smith, H. K. Instruction of High School Students in Reading for Different Purposes. (Cooperative Research Project No. 1714). University of Chicago, 1966.
- Smith, Frank Understanding Reading. New York: Holt, Rinehart & Winston, 1971.
- Smith, Frank Comprehension and Learning: A Conceptual Framework for Teachers. New York: Holt, Rinehart & Winston, 1975.
- Smith, Frank The Role of Prediction in Reading. Elementary English, 52: 3, 1975, 305-311.
- Smith, R. J. & Barrett, T. C. Teaching Reading in the Middle Grades. Reading, Mass.: Addison-Wesley Publishing Co., 1974.
- Spenser, P. L. Reading: A Basic Human Process. Claremont College Reading Conference, Fifteenth Yearbook, 1950. Claremont, California: Claremont College Curriculum Laboratory, 1950, 35-36.
- Squire, James R. The Responses of Adolescents While Reading Four Short Stories. Champaign, Illinois: National Council of Teachers of English, 1964.
- Stauffer, Russell G. Directing Reading Maturity As a Cognitive Process. New York: Harper and Row Publishers, 1969.
- Stauffer, Russell G. Teaching Reading As a Thinking Process. New York: Harper and Row Publishers, 1969.
- Stauffer, Russell G. Reading as Cognitive Functioning. In H. Singer and R. Ruddell (Eds.) Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970.
- Stauffer, Russell G. Action Research in L. E. A. Instructional Procedures. Newark, Delaware: University of Delaware, 1976.
- Stauffer, Russell, Burrows, Alvina & Horn, Thomas. Teachers Edition for Around the Bend. New York: Holt, Rinehart & Winston, 1961.
- Stone, C. R. & Grover, C. C. New Practice Readers. New York: McGraw-Hill Book Company, 1962.
- Strang, R. The Reading Process. In John McInnis (Ed.), Learning to Read: Insights for Educators (Ruth Strang - The Peter Sandiford Memorial Lectures). Toronto: The Ontario Institute for Studies in Education, 1970, 11-33.

- Swain, E. Conscious Thought Processes Used in the Interpretation of Reading Materials. Unpublished Doctoral Dissertation, Department of Education, University of Chicago, 1953.
- Taba, Hilda. Teaching Strategies and Cognitive Functioning in Elementary School Children. San Francisco, California: San Francisco State College, 1964.
- Taba, Hilda, Levine, S. & Elzey, F. Thinking in Elementary School Children. U.S. Office of Education Cooperative Research Project #1574. San Francisco, California: San Francisco State College, 1964.
- Thorndike, E. L. Reading as Reasoning: A Study of Mistakes in Paragraph Meaning. The Journal of Educational Psychology, 8 (6), 1917, 323-332.
- Thorndyke, P. W. The Role of Inferences in Discourse Comprehension. Journal of Verbal Learning and Verbal Behavior, 15, 1976, 437-446.
- Thorne, E. A., Braun, C. & Richmond, M. I. How Many Miles? Comprehension Strategies 3; Teaching Strategies Source Book 3 (Gage Language Strategies Series). Toronto: Gage Educational Publishing Ltd., 1974.
- Thorne, E. A. & Richmond, M. I. People Like Me; Comprehension Strategies 1; Teaching Strategies Source Book 1 (Gage Language Strategies Series). Toronto: Gage Educational Publishing Ltd., 1972.
- Tulving, E. & Gold, C. Stimulus Information and Contextual Information As Determinants of Tachistoscopic Recognition of Words. Journal of Experimental Psychology, 66, 1963, 319-327.
- Valmont, W. J. Creating Visual Activities to Enhance Predictive Behaviors, Language Arts, 54, 1977, 172-175.
- Vernon, M. D. A Further Study of Visual Perception. Cambridge: Cambridge University Press, 1954.
- Vernon, M. D. The Psychology of Perception. London: Penguin Books, 1962.
- Vygotsky, L. S. Thought and Language. Cambridge, Mass.: M.I.T. Press, 1962.
- Wallach, M. A. Perceptual Recognition of Approximations to English in Relation to Spelling Achievement. Journal of Educational Psychology, 54, 1963, 57-62.

- Werner, W. & Kaplan, E. The Acquisition of Word Meanings: A Developmental Study. Monographs of the Society for Research in Child Development, 15, 1950, (1, Whole No. 51).
- White, Ralph. Black Boy, A Value Analysis. Journal of Abnormal and Social Psychology, 42, 1947, 440-461.
- Williams, J. P. Reactions to Modes of Word Recognition. In H. Singer and R. Ruddell, Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1976.
- Wohlwill, J. F. From Perception to Inference: A Dimension of Cognitive Development. In Sigel, I. & Hooper, F., Logical Thinking in Children. New York: Holt, Rinehart & Winston, 1968, 472-494.
- Wolf, W., King, M. & Huck, C. Teaching Critical Reading to Elementary School Children. Reading Research Quarterly, 3:47, 1968, 435-498.

APPENDICES

APPENDIX A

Questions Used in the Interview

QUESTIONS USED IN THE INTERVIEW

Reading

1. How do you feel about reading?
2. Have you any books at home?
3. What are some of the books?
4. Who reads at your house?
5. Does anyone read to you?
6. How old were you when they started reading to you?
7. Did you ask to be read to or did your mother/father suggest it?
8. What kind of books did she/he read to you?
9. Tell me about learning to read.
10. Name some of the books you have read in school.
11. About how many books do you read each week?
12. What kinds of stories do you like to read?
13. Are there some kinds of stories you do not like? What are they?
14. Do you know what fiction means?
15. Do you like to read fact or fiction?
16. Do you read the newspaper? Which parts?

Television and Movies

1. Do you like to watch TV?
2. What kinds of programs do you like?
3. About how much do you watch each day?
4. Do you like to go to movies?
5. How often do you go?

6. What kind of movies do you like best?
7. Is there a kind of movies that you do not like?

Travel

1. Where have you travelled?
2. With whom do you take trips?
3. What kinds of places do you usually visit while on a trip?
4. How do you pass the time in the car as you drive?

Self-concept

1. What things do you do better than most people?
2. What things do you do not so well as other people?
3. What would you like most to be able to do?
4. Are you a good student?
5. Of what things are you afraid?

Perception of the Task

1. Why do you think that you were asked to come here today?
2. How do you feel about coming?
3. Do you know who I am?
4. Why am I asking you to read these stories?

Guessing

1. Are you good at guessing?
2. Do you like guessing games?
3. Do you ever guess answers in school?
4. How does your teacher feel about children guessing?

5. Who guesses in your class?
6. Are these people good students?
7. How do you feel about guessing correctly/incorrectly?
8. Do you like to take risks?
9. Who takes risks in your class?
10. What kind of boy/girl is he/she?

APPENDIX B

Stories

Lazy Luke

Division 1:*

"Hurry up, Luke," called Barry to the little donkey. "Father wants us to take these bags of salt to the fishermen."

Luke was a lazy little donkey. He did not like to work. He did not like the heavy bags of salt on his back.

Suddenly, as he walked slowly along the road, Luke slipped and fell into a stream.

Division 2:

The salt melted in the water. This made Luke very happy. The load became much lighter. Barry told Father about the accident. Father was not happy.

The next day Luke and Barry again set out to make their deliveries. Luke did not like to carry a heavy load. When they came to the stream, the donkey remembered what had happened the day before. This gave him an idea.

Division 3:

"I must make my load lighter," Luke thought to himself.

Falling into the stream on purpose, Luke again lost most of his load. He was happy that his work was finished for another day.

Father had other plans for Luke and Barry. This time he was very angry with the animal.

"Get Luke ready for another trip," he told Barry. "That lazy donkey needs to be taught a lesson."

*It should be noted that in the stimulus materials each division was presented as a separate page of a booklet.

Division 4:

Father had some dry sponges which he loaded into the sack. He placed the sack on Luke's back. Luke and Barry started on their way.

Lazy Luke again was watching for the stream. Once again he slipped and fell. A surprise was waiting for Luke this time!

Division 5:

Instead of getting lighter, his load became heavier. The sponges soaked up the water. They became ten times heavier than before. Barry could not stop laughing.

The donkey struggled home. His back was nearly breaking under the weight of the wet sponges. Father had been too smart for the donkey this time.

A Pearl for a Queen

Division 1:

In a far away land lived a beautiful queen. One day the queen received a costly gift from the king of Persia. It was a gleaming pearl. It was bigger than any the queen had seen. She was very proud to be the owner of such a stone.

Division 2:

With wide eyes, the queen rushed outside. She showed it to the nobles. She was so excited that she dropped the pearl. She let it slip through her fingers. It went into a large hole in a rock.

Division 3:

The queen ordered the wise men to get the pearl from the rock. They tried every plan they could think of. The pearl would not move. She became more and more angry as everything failed.

A small boy was watching closely. He stepped forward. He timidly offered to get back the pearl.

Division 4:

The wise men laughed at the idea. They did not think that a small boy could do it when they had failed. They were the wisest men in the land.

"Let the boy try," said the queen.

With smiles on their faces, the wise men gathered round to watch the boy.

He first made a pile of fine sand. He put it beside the hole. Next, he chose a long thin stick. He pushed the stick into the hole.

At last it touched the pearl. He poured a small bit of sand into the hole. With the stick he turned the pearl over and over.

Division 5:

As the fine sand worked its way under the pearl, it rose up in the hole. At last the boy could reach it with his fingers. He proudly gave the pearl to the queen.

Division 6:

The whole court admired the boy's cleverness. The queen was so pleased that she made him a page in the court.

The Most Dangerous Animal

Division 1:

This mighty fellow is often said to be the most dangerous animal in the world. Indeed, he is the cause of many deaths.

Division 2:

Everything possible should be done to keep him and his brothers out of the house. If they do get in, they should be killed. One way that man can get rid of these enemies is to keep surroundings as clean as possible.

Division 3:

They like to raise their young in dirty places such as manure piles. They feed in outdoor toilets, open garbage cans and on decaying matter of every kind.

The barn and horse stables are the places where they like to raise their young. As garages have taken the place of stables, these fellows become fewer and fewer. Barns and stables must be kept clean so that they can not raise their young in them.

Division 4:

By carrying germs, they cause much sickness each year. Man should try hard to get rid of this enemy.

On their feet are pads which allow them to hang onto a window pane or walk on the ceiling. Germs and dirt are often carried on these pads.

Division 5:

These fellows have two wings. When they bite or when they touch anything, they leave some germs behind. These germs cause such sicknesses as malaria, sleeping sickness or fever. They also cause sickness in animals.

Division 6:

They are among the fastest of all flying insects. The buzzing is the sound of their wings beating. The housefly's wings beat at about 200 times a second. Houseflies fly at a speed of about four to five miles an hour. Their enemies are man and many kinds of birds.

Children can help to keep the surroundings clean in order to get rid of the places where flies hatch and feed.

Man's Worst Enemy

Division 1:

There is an enemy that man has fought for many years. Long ago there were few weapons to fight him. Man trapped him and ate him. But mostly he depended upon prayer to defeat him.

The Bible tells us that this fellow brought hunger to the land. With his friends, he destroyed the crops. He moved from place to place destroying crops as he went.

Division 2:

Today we have found all kinds of poisons to use against him. Each year we try to get rid of him. But each spring he is back again for another visit.

Division 3:

This fellow will eat anything that grows. He is a cannibal. He feeds upon his sick and dead brothers. He will not attack them if they are well.

He will chew holes in Mother's wash. He likes to eat the grass down to the roots.

Not very often will he attack anything that moves. He will attack and chew a man who takes a nap in the field.

Division 4:

When hatched, the baby is wrapped in a thin envelope. He soon starts to wiggle his way out. Once he is out, he rests a little while to dry out. He is then ready to jump, walk or eat.

Division 5:

His jump is one of the wonders of nature. His muscles help him to jump very far. Once in the air, he may not go where he wants to go. Sometimes the wind carries him along. He may turn over and land on his back. This does not seem to hurt him.

Division 6:

His own enemies make the best means of hopper control. Mice, rats and most birds like to eat him.

Some people like to eat this insect. In Mexico, the grasshopper is roasted. It is sold like popcorn on the street corners.

Moose Shooting

Division 1:

"It is time to wake up," Bud called to Jerry. They noticed the light peeping through the curtain. Jerry stepped out of bed. He was greeted by a beautiful July day.

"The day seems bright enough to make our trip successful," said Jerry. The boys left the house.

Division 2:

The water was calm. They paddled slowly to the other side of the lake. They put the equipment into the bow of the boat. Then they glided smoothly through the water.

"There's a big one," called Bud. He pointed to a fine moose. It was not very far away.

Division 3;

"A fine set of antlers," said Jerry. He pictured them among his collection.

"I'll send my uncle a picture of those," he thought.

Division 4:

They guided the boat through the tall grass. They wanted to get nearer in order to get a good shot. Now the moose was only fifty feet away.

Division 5:

"Click!" The moose lifted its head. It looked over at Bud

and Jerry. The ears stood up. The nose twitched.

Again Jerry took careful aim and shot.

Division 6:

As quick as a flash the moose turned and jumped towards Bud and Jerry. Like lightning it went flying through the air. Then it hurried off into the forest.

"Well I got two good shots anyhow," Jerry said as they headed home to develop the film.

A Dog's Tricks

Division 1:

It was a beautiful day in August. The sun was high in the sky. Rickey heard the sound of children's voices. He crossed the street to see what was happening.

People were gathered at the park. They were watching an old man with a little brown dog. The dog was doing tricks. Rickey decided that he had seen better tricks than this at the circus. He threw a few pennies into the dirty hat. Then he decided to go on his way.

Division 2:

Suddenly, as the crowd began to leave, the man let out a cry. He bent over his dog. The dog lay on the ground. The man picked up the little body. It seemed lifeless.

Division 3:

The man held the body close to him. Then he began to cry. A young man stepped forward from the crowd. He put some money into the hat. Others did the same thing. Soon the pennies were covered with silver coins.

Division 4:

After a few months, Rickey saw the old man again. He was in another part of the city. The man had another little brown dog. He must have bought it with the money the crowd had given him. This little dog's tricks were not much better than those of the first dog. Rickey

was happy to see the old man earning a living again.

Division 5:

Since Rickey felt that he had helped to pay for this little dog, he did not throw any money into the hat. The act was not over yet! To Rickey's surprise, the old man once again let out a loud cry. It happened just as the crowd began to leave.

Division 6:

Once again the dog lay still on the ground. The old man picked up the body. He began to cry.

The same young man stepped forward. He threw some money into the hat. Again the crowd threw money too -- except Rickey. Smiling to himself Rickey went on his way, surprised at the man's boldness. Rickey was not fooled this time.

On the Spot

Division 1:

In a small cabin at the edge of the forest, Nancy Vincent lived many years ago. She lived with her father, her mother and her grandmother.

Often the Vincents faced danger for they were pioneers. Sometimes wild animals attacked their cattle and their sheep. At other times, Indians, with whom they were at war, were waiting to attack.

One morning Father noticed that one of the lambs was missing. After looking around, Mr. Vincent said that it must have been killed by a wolf.

Division 2:

The strange look on Father's face made eleven-year-old Nancy wonder. Father went off to the woods to work. Nancy searched for clues about the missing lamb. She noticed many animal tracks. But also there was the print of a moccasined foot.

Division 3:

Nancy wondered what had happened to the little animal. Later in the morning, she heard the sound of a horse galloping up to the house.

Division 4:

It was their nearest neighbour, Mr. Blackburn. He looked very worried.

"Is it Indians?" asked Nancy.

"No," said Mr. Blackburn, "but I do need help. My wife is sick and I have come to see if your mother can help us for a while."

Nancy said that she would take care of her sick grandmother. But as she thought of the moccasin track, her face paled. Soon they were gone and Nancy and her grandmother were left alone.

Division 5:

As Nancy was preparing a wild berry drink for Grandmother, she noticed a brown painted face peeking from the bushes. Startled, she let some of the drink fall on her hand. She noticed that it left a bright red mark. An idea came to her. There might be a way to save them from the Indians.

Division 6:

She crept over to the bed and told Grandmother her plan.

"You must help me," she said. Then she whispered something to the old woman.

"Well, Nancy Vincent," Grandmother said, "you are a wonder. Hurry and get me fixed up."

When she had fixed up herself and Grandmother, Nancy pushed the couch close to the fire. On the table by the couch she placed bottles of medicine.

"They are coming, Grandmother," she whispered.

Nancy stretched out in a chair. She groaned loudly. Painted faces stared in from outside. The Indian chief came in. Behind him came the others.

Division 7:

Nancy stood up and took a step toward the Indians. She raised her hands and pointed toward her face. The blazing fire showed the Indians a girl and an old woman. They were covered with bright red spots.

Division 8:

Without another word the Indians shouted cries of fear. They rushed from the cabin and ran into the woods.

Nancy closed the door. She and her grandmother laughed, then cried, then laughed some more. Something had frightened the Indians away. A miracle had taken place.

Nancy knew that the Indians feared smallpox. When Mother returned, they told her of Nancy's miracle.

The Robbery

Division 1:

Six passengers were riding along a lonely road. They were riding in a stagecoach. They talked about thieves. The thieves were always busy along this road. They told what they would do if a robber should come.

One young woman was not very wise. "I carry all my money in a thousand dollar bank note," she said. "I have hidden it in my shoe. It is hidden so well that robbers would never find it."

Suddenly the passengers heard a shout.

Division 2:

"Robbers!" said the driver.

The thieves asked for the passengers' purses. They were not happy with the small amount of money they found inside them. They said that they needed five hundred dollars. If they did not find enough money, they would search everyone and torture them.

Division 3:

They seemed ready to do this. Suddenly an old man who had been sitting quietly in the back of the coach spoke.

"You will find twice that amount in that lady's shoes and stockings. Make her take off her shoes."

The robbers did what the man said. They found the money. They left with twice as much as they had hoped to get.

Division 4:

At once the passengers cried out against the old man. They insulted him. They said that they might throw him off the coach. The young woman began to cry.

The old man did not seem to mind their sorrow. All he said was that everyone must think of himself first. That evening the coach arrived in town. The old man quickly went away.

The young woman went to the inn. She did not sleep well that night. She got up early the following morning. She heard a knock on her door. She opened her door just in time to see an old man. It was the old man from the stage. He ran down the stairs. She found an envelope on the door.

Division 5:

When she opened the letter she read.

"Young woman, the man you hated yesterday returns the sum of money you lost. I return double the amount. I am very sad to cause you sorrow. A few words will explain why I did it."

Division 6:

"I have just returned from another country. There I spent ten weary years. During that time I earned much money. I had all of this money hidden on me yesterday. If the robbers had searched everyone, I would have lost it all. I could not chance so much. Please excuse me for what I did yesterday. Will you accept something extra for your hardship?"

Chippy's Choice

Division 1:

The last trace of winter slipped away. The loggers were eager to get their logs to the sawmill to be cut. They had waited for the ice to break up. Now it was melting. In the upper country, every stream carried many logs to the river. The logs shot through the rapids down toward the sawmill.

Chippy, the chipmunk, sat in a tree on the bank of the river. Chippy's tree began to lean. Then into the racing water it went! Chippy fell with the tree. He managed to swim to a passing log. Now the lonely little rider was swept into the main current.

Division 2:

On his long trip not a single chance to reach shore came his way. Even greater dangers lay ahead. A little way off the banks were high. Here the water turned into a roaring rapid. Chippy was frightened. He searched for a way out.

Division 3:

While this was happening, he noticed what at other times would have frightened him very much. A row-boat drew nearer. Tom Brown was in the boat. He had been fishing. As the boat drew nearer, Tom noticed the trembling chipmunk on the log.

Division 4:

Chippy stood his ground. He was not leaving that log. With a smile the fisherman pushed out the tip of an oar towards the log. He

invited the chipmunk to hop on.

Division 5:

Chippy did not trust the boy. Yet he trusted him more than the rapids ahead. He skipped aboard the boat. He kept as far as possible from Tom. The fisherman soon glided towards shore.

Tom wanted to see what the chipmunk would do. He stretched out both hands to block his way to safety. Then he waited.

Division 6:

The little animal darted away. He paused and gave a nervous "Chip, Chip". Then he jumped high into the air. For a second his feet hit sharply on the top of Tom's head. Then he ran off. Up the bank and into the forest he ran! A minute later, from the top of the tree, there came a loud chatter.

"Saucy little fellow," said the fisherman.

Frontier Dangers

Division 1:

Frontiersman, Sam Stanton, went bear hunting one day. He did not see a bear, but he did shoot two geese. That evening as he was getting ready to cook his supper, he heard a noise. He was frightened by the sound of a strange horse nearby.

Division 2:

He moved quietly along the river. The night began to fall. Suddenly he saw a light. He heard voices. The voices were coming from an old cabin. The cabin was on the side of the mountain. Thinking that he had come upon a party of trappers, he climbed up to the cabin. He boldly knocked on the door.

Division 3:

At once the voices stopped. Someone called out,

"Who is there?"

"A friend," Sam answered.

A big ugly fellow opened the door.

"Come in," he said.

Trying to hide his fear, Sam went in. He knew now that these eight men were outlaws. They were wanted for murder and robbery.

Division 4:

Sam explained that he must go get his horse. The outlaws knew that he planned to escape. They would not be fooled.

"Tim and I will go with you," one said.

"You can leave your gun. You will not need it."

Sam helplessly agreed. Together the three men went down to the river. There they found the horse. On their return, the man with the horse took the lead. Next came Sam, carrying his geese. Last came the other outlaw carrying the gun. Sam knew that he must make his move before he got back to the cabin.

Division 5:

As they climbed the steep hill, Sam purposely dropped one of his geese. It rolled down to the man behind him. When the man stopped to pick it up, Sam grabbed a rock. He brought it down on the outlaw's head. He grabbed the revolver and shot the gun from the hand of the other outlaw. He jumped on his horse. Sam then rode down the steep rocky hill.

Sam knew the other outlaws would soon be on his trail. The horse could not make good time down the rough mountain. In a moment the outlaws would be close behind. Sam knew his horse could not outrun the others. He had to find a way to get the outlaws off his trail.

Division 6:

Sam got off his horse and slapped him. The horse headed down into the valley. Then Sam jumped behind a large tree. Minutes later, the men came down the trail. They passed the tree. Then they rode on after the horse which they could hear ahead of them. Sam's fast thinking had saved him again.

APPENDIX C

Multiple Choice Tests

and

Open-ended Questions Tests

Lazy Luke

1. Luke and Barry were delivering
 - A. sugar
 - B. salt
 - C. fish
2. Luke and Barry were making deliveries to
 - A. merchants
 - B. fishermen
 - C. farmers
3. The first time Luke fell into the stream it was
 - A. on purpose
 - B. an accident
 - C. Barry's fault
4. On his last trip Luke carried
 - A. salt
 - B. sugar
 - C. sponges
5. Father outsmarted Luke by
 - A. giving him a smaller sack
 - B. giving him a bigger sack
 - C. changing what was in the load
6. The number of trips that Luke and Barry made was
 - A. two
 - B. three
 - C. four
7. Luke's back was breaking because he was carrying
 - A. sugar and water
 - B. sponges
 - C. sponges and water

8. To deliver means
- A. to carry goods to
 - B. to give back
 - C. to make heavier
9. When Luke fell into the stream the last time, Barry
- A. scolded him
 - B. laughed
 - C. became angry
10. After the third fall Luke's load became
- A. five times lighter
 - B. five times heavier
 - C. ten times heavier

A Pearl for a Queen

1. The queen was proud of the gift because of its
 - A. size
 - B. colour
 - C. shape
2. The jewel slipped into a hole
 - A. in the ground
 - B. in a rock
 - C. in a log
3. When the boy offered to get the pearl, he felt
 - A. afraid
 - B. proud
 - C. sure of himself
4. In trying to get the pearl, the boy first
 - A. turned the pearl over
 - B. chose a long stick
 - C. made a fine pile of sand
5. The boy turned the pearl over in order to get
 - A. the stick under it
 - B. the sand under it
 - C. his fingers under it
6. When the boy took the pearl from the rock, the nobles felt
 - A. angry
 - B. displeased
 - C. happy
7. A costly gift is
 - A. a valuable gift
 - B. a beautiful gift
 - C. a big gift

8. The fine sand
- A. covered the pearl over
 - B. made the pearl rise high in the hole
 - C. pushed the pearl to the bottom of the hole
9. A gleaming pearl is
- A. a shining pearl
 - B. a colourful pearl
 - C. a costly pearl
10. The queen dropped the pearl because
- A. she was excited
 - B. she was angry
 - C. she was tired

The Most Dangerous Animal

1. The most common breeding places for flies are
 - A. garages
 - B. manure piles
 - C. clean stables
2. Stables have been replaced by
 - A. barns
 - B. garages
 - C. pastures
3. Flies can walk on the ceiling because on their feet they have
 - A. pads
 - B. hairs
 - C. a sticky substance
4. The best way to control flies is to use
 - A. fly spray
 - B. fly swatters
 - C. cleanliness
5. The story says that often germs are carried on the fly's
 - A. pads
 - B. wings
 - C. hairs
6. The number of wings that houseflies have is
 - A. two
 - B. four
 - C. six
7. The number of miles per hour that the housefly can travel is
 - A. one to two
 - B. four to five
 - C. six to seven

8. The housefly carries germs which cause sickness in
- A. man
 - B. animals
 - C. man and animals
9. Besides man, another enemy of the housefly is
- A. rats
 - B. mice
 - C. birds
10. The housefly's wings beat about
- A. 200 times a second
 - B. 500 times a second
 - C. 1000 times a second

Man's Worst Enemy

1. Early man tried to get rid of grasshoppers by
 - A. spraying poison
 - B. praying
 - C. flooding fields
2. When the author says that the grasshopper is a cannibal, he means that it eats
 - A. clothes
 - B. grass
 - C. its brothers
3. The grasshopper will not attack its
 - A. healthy brothers
 - B. sick brothers
 - C. dead brothers
4. The grasshopper will attack a man
 - A. who works in a garden
 - B. who sleeps in the field
 - C. who cuts the grass
5. In Mexico, before grasshoppers are sold on the street corners they are
 - A. roasted
 - B. fried
 - C. boiled
6. The grasshopper is called man's worst enemy because he
 - A. is a cannibal
 - B. attacks a man who is asleep
 - C. destroys crops
7. One of the wonders of nature is
 - A. the grasshopper's eating habits
 - B. the grasshopper's jump
 - C. the grasshopper's breeding habits

8. The word defeat in this story means
- A. beat up
 - B. get rid of
 - C. win a battle
9. The grasshopper does not attack anything that is
- A. asleep
 - B. dead
 - C. moving
10. The story says that we can read about the grasshopper in
- A. a science book
 - B. a history book
 - C. the Bible

Moose Shooting

1. The story took place in the
 - A. spring
 - B. summer
 - C. fall
2. The boys put their equipment
 - A. in the bow of the boat
 - B. in the stern of the boat
 - C. on the deck of the boat
3. Jerry said that he would send a picture to
 - A. his father
 - B. his uncle
 - C. his friend
4. The pictures were taken when the moose was
 - A. seventy-five feet away
 - B. fifty feet away
 - C. twenty-five feet away
5. The pictures were taken by
 - A. Jerry
 - B. Bud
 - C. Both Jerry and Bud
6. When the moose noticed the boys, it was
 - A. hungry
 - B. unconcerned
 - C. nervous
7. The story shows that
 - A. Jerry had taken pictures before
 - B. Bud had taken pictures before
 - C. Jerry had not taken pictures before

8. The word equipment refers to
- A. a gun
 - B. the oars
 - C. the camera
9. In this story to be successful means
- A. to kill a moose
 - B. to get good pictures
 - C. to get away from the moose
10. In this story collection refers to
- A. antlers
 - B. stamps
 - C. pictures

A Dog's Tricks

1. This story took place
 - A. in the city
 - B. in the country
 - C. at the circus grounds
2. Rickey went to the park because he heard the
 - A. dog barking
 - B. old man calling
 - C. children's voices
3. The number of people in this act was
 - A. one
 - B. two
 - C. three
4. Rickey put money in the hat
 - A. the first time he saw the act
 - B. the second time he saw the act
 - C. every time he saw the act
5. At the end of the second act, Rickey felt
 - A. very angry
 - B. annoyed
 - C. pleased
6. The first act took place
 - A. in the morning
 - B. in the evening
 - C. in the afternoon
7. The second act took place
 - A. a few months after the first act
 - B. a few days after the first act
 - C. a few weeks after the first act

8. The man let out a cry because
- A. he thought the dog was dead
 - B. he wanted the crowd to come back
 - C. he wanted the dog to get up
9. The man who began to cry was
- A. old
 - B. young
 - C. very sad
10. Lifeless means
- A. lively
 - B. full of life
 - C. without life

On the Spot

1. Father said that the lamb must have been killed by
 - A. Indians
 - B. wild animals
 - C. a wolf
2. Mr. Blackburn needed help because
 - A. his mother was sick
 - B. the Indians had attacked
 - C. his wife was sick
3. The idea for saving herself and Grandmother came to Nancy because
 - A. Grandmother was sick
 - B. the berry juice made a spot on her hand
 - C. she was afraid
4. Getting Grandmother 'fixed up' means
 - A. pulling the couch up close to the fire
 - B. getting the medicine bottles for her
 - C. painting the red spots on her face and arms
5. Nancy groaned loudly because
 - A. she wanted to fool the Indians
 - B. she was sick
 - C. she was afraid
6. When the Indians entered the house Nancy
 - A. ran away from them
 - B. took a step toward them
 - C. stayed on the couch
7. The Indians disappeared because
 - A. they feared the blazing fire
 - B. they heard Nancy groan
 - C. they feared smallpox

8. The Vincents were good neighbours because
- A. they helped Mr. Blackburn
 - B. they frightened the Indians
 - C. they took care of Grandmother
9. In the morning, Father went to work
- A. in the fields
 - B. in the town
 - C. in the woods
10. The Vincents lived
- A. deep in the forest
 - B. at the edge of the forest
 - C. at the edge of a river

The Robbery

1. The robbers found the money because
 - A. the man told them where to find it
 - B. they tortured the passengers until they told
 - C. they searched all the passengers carefully
2. Finding more money than they had hoped for, the robbers left with
 - A. two thousand dollars
 - B. one thousand dollars
 - C. five hundred dollars
3. After the robbers left, the other passengers
 - A. decided to throw the man off the coach
 - B. insulted the old man
 - C. thanked the old man for saving them from torture
4. By telling where she had hidden her money, the young woman showed that she was
 - A. wise
 - B. foolish
 - C. frightened
5. The coach arrived in town
 - A. early in the morning
 - B. in the afternoon
 - C. in the evening
6. The letter was left on the door by
 - A. the old man
 - B. the robbers
 - C. the stage coach driver
7. The amount of money in the envelope was
 - A. five hundred dollars
 - B. one thousand dollars
 - C. two thousand dollars

8. The old man told the robbers where the woman had hidden her money because
- A. he did not want the robbers to torture him
 - B. he did not want the robbers to search him
 - C. he did not want to lose one thousand dollars
9. To torture means
- A. to search
 - B. to hide
 - C. to hurt
10. The young woman heard a knock on her door
- A. before she went to bed
 - B. in the middle of the night
 - C. early in the morning

Chippy's Choice

1. This story took place in the
 - A. winter
 - B. fall
 - C. spring
2. The tree fell into the stream because the
 - A. water pushed it
 - B. water wore away the river bank
 - C. wind blew it over
3. Tom called Chippy saucy because the chipmunk
 - A. was trembling on the log
 - B. did not trust the fisherman
 - C. chattered as if to make fun of Tom
4. When Tom stretched out his hands, Chippy
 - A. jumped on his head
 - B. crouched in his corner
 - C. jumped into the water
5. From the story we can see that Tom was
 - A. cruel
 - B. kind
 - C. old
6. When the author says that Chippy paused, he means that he
 - A. jumped
 - B. darted away
 - C. stopped
7. - Loggers in the upper country send their logs to the sawmill by means of
 - A. trucks
 - B. boats
 - C. streams

8. The upper country means
- A. a place where there are hills
 - B. a place where there are animals
 - C. a place where there are boats and fishermen
9. The 'lonely little rider' refers to
- A. Tom Brown
 - B. Chippy
 - C. the fisherman
10. You can tell that Chippy was frightened because the author says that he was
- A. chattering
 - B. swimming
 - C. trembling

Frontier Dangers

1. Sam Stanton set out to hunt
 - A. bears
 - B. deer
 - C. geese
2. The cabin was
 - A. in the deep woods
 - B. hidden by a steep hill
 - C. on the side of a mountain
3. When Sam went to the cabin, he expected to find
 - A. hunters
 - B. trappers
 - C. outlaws
4. As an excuse to leave the cabin, Sam said that he must get his
 - A. horse
 - B. geese
 - C. gun
5. On their return to the cabin, the man who took the lead was
 - A. Sam
 - B. the man with the gun
 - C. the man with the horse
6. When the author says that Sam purposely dropped one of his geese, he means
 - A. Sam meant to drop it
 - B. Sam dropped it by accident
 - C. Sam did not know that he dropped it
7. The outlaws were wanted for
 - A. horse stealing
 - B. murder
 - C. murder and robbery

8. The story may have happened
- A. ten years ago
 - B. one hundred years ago
 - C. twenty years ago
9. Sam knew that he was not alone beside the river because he
- A. heard voices
 - B. heard a strange horse
 - C. saw a party of trappers
10. Sam hit the outlaw with
- A. his fist
 - B. his gun
 - C. a rock

Open-ended Questions Tests

Lazy Luke

1. How did Luke feel after he slipped into the stream the first time?
2. How many of Luke's falls were accidental?
3. How did Father teach Luke a lesson?
4. How did Barry feel about Luke's laziness?
5. Explain why Luke's first load became lighter when he fell into the stream.

A Pearl for a Queen

1. What caused the Queen to drop the pearl?
2. How did the boy feel when he offered to get the pearl from the rock?
3. What did the wise men think of the boy's offer?
4. Describe the boy's plan to get the pearl.
5. How was the boy rewarded for getting the pearl?

The Most Dangerous Animal

1. What is one of the best ways to get rid of flies?
2. Where do flies like to raise their young?
3. Why is the fly called the most dangerous animal?
4. Why do we hear a buzzing sound from flies?
5. How fast can the housefly travel?

Man's Worst Enemy

1. Why does the grasshopper sometimes land on his back when he jumps?

2. What is one interesting way in which Mexicans serve grasshoppers?
3. Who has a better way of controlling grasshoppers, early man or farmers today?
4. Describe the first few moments in the life of a grasshopper.
5. What is the best means of hopper control?

Moose Shooting

1. How do you think Jerry felt about his uncle?
2. Do you think that Jerry had taken pictures before? Why?
3. During what season of the year do you think that this story took place?
4. How did the moose feel when he saw the boys?
5. What kind of equipment was in the bow of the boat?

A Dog's Tricks

1. Why did the crowd begin to leave the park?
2. What was the old man doing while the crowd threw money into the hat?
3. How did the young man happen to be present at both acts?
4. Why did Rickey not put any money into the hat the second time?
5. Why did the old man let out a cry?

On the Spot

1. What were some of the hardships faced by pioneers?
2. Why did Father have a strange look on his face after he noticed that one of the lambs was missing?
3. Why did Nancy's face get pale when she thought of the moccasin track?
4. What is meant in this story by getting 'fixed-up'?
5. Why did the Indians run away?

The Robbery

1. How did the young woman show that she was not wise?
2. How did the other passengers feel about the old man after he told where the woman had hidden the money?
3. Was the old man justified in doing what he did?
4. About how long ago do you think this story took place?
5. What did the thieves say that they would do if they did not find more money?

Chippy's Choice

1. In what season of the year did this story take place?
2. What kind of boy do you think Tom was?
3. What is meant by the upper country?
4. Why did Tom call Chippy a saucy little fellow?
5. Tell how Chippy managed to get off the log and into the boat.

Frontier Dangers

1. Why did Sam climb up to the cabin on the side of the mountain?
2. Why did Sam tell the men that he had to go get his horse?
3. Why did Sam have to make his move before he got back to the cabin?
4. How did Sam show that he was a fast thinker?
5. How long ago do you think this story took place?

APPENDIX D

Order of Presentation of Stories

Order of Presentation of Stories

Subject	Pattern	Subject	Pattern	Subject	Pattern	Subject	Pattern
1	*MS - U	2	DA - P	3	OS - U	4	LL - P
	DA - P		OS - U		LL - P		MS - U
	OS - U		LL - P		MS - U		DA - P
	LL - P		MS - U		DA - P		OS - U

Subject	Pattern	Subject	Pattern	Subject	Pattern	Subject	Pattern
5	MS - P	6	DA - U	7	OS - P	8	LL - U
	DA - U		OS - P		LL - U		MS - P
	OS - P		LL - U		MS - P		DA - U
	LL - U		MS - P		DA - U		OS - P

S₁ - Grade 4: Prof M
LP F

Grade 6: Prof F
LP M

S₂ - Grade 4: Prof M
LP F

Grade 6: Prof M
LP F

S₃ - Grade 4: Prof F
LP M

Grade 6: Prof M
LP F

S₄ - Grade 4: Prof M
LP F

Grade 6: Prof M
LP F

S₅ - Grade 4: Prof F
LP M

Grade 6: Prof M
LP F

S₆ - Grade 4: Prof M
LP F

Grade 6: Prof F
LP M

S₇ - Grade 4: Prof F
LP M

Grade 6: Prof F
LP M

S₈ - Grade 4: Prof F
LP M

Grade 6: Prof F
LP M

* Key to Abbreviations

MS - Moose Shooting
DA - The Most Dangerous Animal
P - Probed
Prof - Proficient Readers
M - Male

OS - On the Spot
LL - Lazy Luke
U - Unprobed
LP - Less Proficient Readers
F - Female

APPENDIX E
Directions for Reading

Directions for Reading

Directions - Unprobed

I am interested in finding out what children think about as they read stories. I would like to have you read a story and tell me all the thoughts that come to your mind as you read. I do not mean for you to tell me what the story is about. Tell me just the things you think about as you read.

When you want to tell me what you are thinking, put your finger at the beginning of the line to hold your place. If there are words you do not know ask me to tell you what they are.

I am going to read part of this story, 'Frontier Dangers', to show you what I mean. Then you may read the remaining portion of the story and tell me your thoughts as you read.

The comments of the investigator as she demonstrated telling thoughts while reading are listed below:

1. That could be dangerous (because it said dangers in the title).
2. I bet it was a bear (because he was bear hunting).
3. Maybe an Indian is on the horse (because it is a frontier).
4. I can picture the river and the trees.
5. There must be people (because they would need a light).
6. It reminds me of a story I once read.
7. I can picture a tall man who is not very clean (because they live in a cabin).
8. Some movies are like this.

After the subject observed the demonstration, he was asked to use the remaining portion of the story as practice material. The

subject's difficulties or misunderstandings were further clarified.

This was followed by:

You did a fine job of telling your thoughts. Here is another story for you to read silently. Remember, I do not mean for you to tell what the story is about. Tell me just the things you think about as you read it.

Directions - Probed

Here is a story that I think you may like. I would like for you to read silently to the end of the page and I will ask you a question about the remaining portion of the story.

APPENDIX F

DATA

Grade Four

Less Proficient Readers

Moose Shooting

Subject 1

Unprobed

S1: Here. He called out.

S1: He saw the moose and he wanted to shoot it.

S1: He thought he could get a good shot.

S1: The moose must have seen the gun.

S1: Ah... He must have shot it ... because it says Jerry took a good
aim and shot.

S1: Bud and Jerry must have been scared ... because the moose jumped
into the air like lightning.

S1: Bud and Jerry must have been kind of upset... because the moose
ran back into the forest.

S1: They must have been angry... because at least they got some
pictures.

The Most Dangerous Animal

Subject 1

Probed

S1: A tiger

S1: A dinosaur ... because he causes many deaths.

S1: A cockroach ... because they go in the house.

S1: Rats ... because they cause sickness every year.

S1: Bees ... because they have two wings.

S1: Ticks ... because they also cause sickness in animals.

S1: A cricket ... because they make sounds with their wings.

S1: What was the answer? Was it houseflies?

On The Spot

Subject 1

Unprobed

S1: I can picture the small cabin by the forest.

S1: Father must have been upset ... because one of the lambs were missing... because they needed wool to make clothes out of it.

S1: Nancy must have been upset ... because of one of the little animals.

S1: Nancy must have been scared when the Indians made a fire ...because I would have been scared.

Lazy Luke

Subject 1

Probed

S1: Lazy Luke will help Barry out of the stream ... because it's Barry's donkey.

S1: The donkey will feel sorry ... because Barry might have got in trouble.

S1: Teach the donkey a lesson ... because every time they went out with the big bags of salt, they fell into the stream.

S1: Barry will go on without him ... because he didn't have any salt in the pack on Luke's back.

The Most Dangerous Animal

Subject 2

Probed

S2: A dragon ... because they say they are most dangerous.

S2: I think it's a dog ... because it says he chased his brothers out of the house and tried to keep them out.

S2: I think it's a snake now ... because, well, when it says "up there "by the house", it could have been a snake as well.

S2: It could have been a crow ... because it says two wings and they bite.

Subject 2

Probed

S2: I think it's a fly now.

S2: They say a housefly. It could have been a bee too.

On The Spot

Subject 2

Unprobed

S2: It could have been Indians or outlaws ... because it says
pioneers and dangers.

S2: It says a wolf but I think it was an Indian that could have
killed it ... because he could have killed it for food.

S2: I think it is an Indian ... because she seen moccasin tracks.

S2: It could have been Indians ... because it says horses are
galloping.

S2: It wasn't Indians ... because Mr. Blackburn's wife was sick.

S2: She was going to get the wild berry juice and she seen this
Indian and she said there might be a way out of getting killed.

S2: They have a plan, Nancy and her grandmother. And there might be
Indians coming.

S2: She has this plan like about this Indian Chief and behind them
are other Indians.

Lazy Luke

Subject 2

Probed

S2: Well he is going to be in trouble by his father and the fishermen ...
because he fell into the stream and lost the salt.

S2: Well, he might stop him ... because he knows what he is going to do.

S2: Well, he might give away the donkey ... because he thinks it's the
donkey that's doing it.

S2: Well, his father might come ... because he said there was going to
be a surprise waiting for the donkey.

S2:

Moose Shooting

Subject 2

Unprobed

S2: They say that the moose. I don't know if they are trying to shoot
it yet. They might be trying to take the antlers off it.

On The Spot

Subject 3

Unprobed

S3: There is a cliff and someone lives there.

S3: They must have been poor ... because they were pioneers and lived in cabins.

S3: I got a picture of someone attacking cattle.

S3: Someone took a lamb.

S3: Mr. Vincent was angry - Who killed the lamb?

S3: His daughter might be afraid that he might get hurt.

S3: There you go, an Indian did it... because it says there that there were moccasined foot prints.

S3: She was worried.

S3: There was something coming at the house.

S3: Someone was worried.

S3: Someone needed help.

S3: She got pale.

S3: They were left alone.

S3: There's a face.

S3: Someone was. She wanted to save someone by the Indians.

S3: She told her something.

S3: She got her fixed up.

S3; Indians were coming.

S3: The Indian Chief came.

Subject 3

Unprobed

S3: They were covered with spots.

S3: She made a miracle.

Lazy Luke

Subject 3

Probed

S3: He'll try to get the donkey... because he fell into the stream.

S3: He is going to spill the salt again ... because he is getting the idea.

S3: He is probably going to lock him up or something... because he said he is going to teach him a lesson.

S3: He might get in trouble again ... he slipped and fell again.

Moose Shooting

Subject 3

Unprobed

S3: It was a beautiful day.

S3: They went moose hunting.

S3: They had equipment.

Subject 3

Unprobed

S3: The moose had good antlers.

S3: They shot it ... because it says.

S3: They went home to develop film.

The Most Dangerous Animal

Subject 3

Probed

S3: A lion ... because well he is very strong.

S3: Is it a rat? ... because it says in barns, likes garbage and everything.

S3: Would it be geese? ... well because it says they have pads on their feet.

S3: A housefly.

Lazy Luke

Subject 4

Probed

S4: The salt will pour out and he'll get right mad and everything ... because it is all heavy and everything and he is going to have a hard trouble putting it back in the sack.

Subject 4

Probed

S4: He will help Luke put the salt back and everything ... because he felt sorry for him.

S4: He will tell Barry and Luke to do some other job beside taking the salt some place ... because he might slip and spill the salt that Father gave him.

S4: The donkey will help him get up, shove him up, and the donkey will help him put the salt on the donkey's back ... because he felt sorry because he kept slipping and falling.

Moose Shooting

Subject 4

Unprobed

S4: He wanted antlers for his collection.

S4: He wanted to prove that he could catch a moose and show him that he did catch a moose.

S4: It was scared of Bud and Jerry.

The Most Dangerous Animal

Subject 4

Probed

S4: A tiger ... because it claws and bites and everything.

Subject 4

Probed

S4: A horse ... because it has lines and things, and all the things
lays young in dirty places.

S4: A bug ... because it can walk on the wall and it can give sickness.

S4: A moth ... because it has wings and they bite when they touch
anything.

S4: It is an insect.

S4: It is a housefly.

On The Spot

Subject 4

Unprobed

S4: Hope it's not too long!

S4: She lived many years ago.

S4: They faced bears and lions and everything.

S4: Bears, tigers and wildcats attacked their cabin and cattle and
sheep.

S4: Maybe an Indian might have took it or a bear might have ate it.

S4: He was trying to find the missing lamb.

S4: She wanted to get involved to find the missing lamb.

S4: She noticed some tracks that maybe the lamb was carried off by.

S4: Still more to read!

Subject 4

Unprobed

S4: Because she thought the Indians might have took the lamb she liked.

S4: She might have saw an Indian behing the bushes ... because it's got a brown face and it's painted.

S4: So they would take her near the lamb... because she wants to get the lamb back really bad.

S4: The Indian Chief came in to get the girl to take to camp.

S4: They were scared of the red dots ... because they never seen red dots before on people's faces.

Moose Shooting

Subject 5

Probed

S5: They will have the moose and they'll probably take off the antlers.

The Most Dangerous Animal

Subject 5

Unprobed

S5: They find out that there is a very dangerous animal.

S5: The dangerous animal likes to be in dirty things and eats dirty things.

Subject 5

Unprobed

S5: The dangerous animals can cause fever sickness and malaria.

On The Spot

Subject 5

Probed

S5: He will probably go out and try to find sheep that just strayed off or something ... because well if he thinks a wolf had killed him he wouldn't be looking for it.

S5: She'll probably go out farther into the woods and see if an Indian has got it ... because maybe an Indian took it for food.

S5: I think it's an Indian ... because he came to get another sheep or something.

S5: I'm not sure what will happen now.

S5: She'll go see if it's an Indian. She thinks that it's an Indian ... because it had brown and very bright red on its face.

S5: The Indians might attack ... because they came in the house.

S5: The Indians might go away ... maybe they think it's some kind of sickness or a god.

Lazy Luke

Subject 5

Unprobed

S5: Ah, Luke. Father told them to bring bags of salt to the fishermen.

S5: Ah, the donkey didn't like carrying bags on his back ... because he was lazy.

S5: Luke fell into a stream and he was happy ... because he didn't like carrying heavy things on his back, and when he fell over it was lighter and fell off.

S5: He was carrying another heavy load and he saw the stream and he remembered what happened yesterday.

S5: The donkey was taught a lesson ... because he thought when he came to the stream he could dump all the heavy things off his back.

The Most Dangerous Animal

Subject 6

Unprobed

S6: I think that there's going to be dangers and a lot of killing ... because it said dangers.

S6: They like to raise young in dirty places. The young die ... because they bring them up in dirty places.

S6: They put stuff on their feet to make them climb walls. They cause lots of sicknesses. Some of the sicknesses are sleeping sickness and fever sicknesses in animals.

Subject 6

Unprobed

S6: It never said in the story what kind of bird or fly it is.

On The Spot

Subject 6

Probed

S6: He might get one of the men to help him to get the Indians ...

well one of the sheep got stolen and he thought the Indians probably would take them.

S6: She might go to the Indian's tribe and try to find out clues, or if she finds the lamb she might take it ... because she has been looking for clues.

S6: I think it's Indians coming to steal a lamb ... because she heard foot sounds and she wondered. So I think it's Indians coming back for more.

S6: Well Nancy kept thinking about the moccasin with her and her grandmother alone. With Father away and Mother with Mrs. Blackburn, they might come and steal a lamb and take her and Grandmother away... because there is nobody to protect her if the Indians come.

S6: Well, she spilled some berry drink on her hand and it turned red. If the Indians think that it is blood and she hurt herself, they won't touch her or anything ... because the Indians might be

Subject 6

Probed

afraid of blood and stuff like that. They might think that if she has a disease, they might catch it. They will die and they don't want to die.

S6: Well the Indian Chief just came in. I think if he believes that Nancy is really sick and so is her grandmother, they will go away or try to help her ... because well, she would be scared.

S6: Well the Indians think she has the chickenpox. If they take them with them, they will get chickenpox too and get really sick. They don't want that to happen ... because they don't want to get sick.

Lazy Luke

Subject 6

Unprobed

S6: Lazy Luke was lazy and never wanted to do much around the barn or anything, I think.

S6: Luke used to make up ideas from the day before, because he knew if that would happen it would make something lighter for him, and he wouldn't have to do much work. He wouldn't be able to work at the farm anymore.

S6: Barry's father knew that Luke was going to do something, so he was ready for him. I think later in the story he will do more work rather than just a little bit each day ... because it said about just going to do it again.

Subject 6

Unprobed

S6: Luke thought he could just keep doing what he was doing, but he couldn't. He had a surprise coming. I think that the surprise was that he was going to have to go into the water and get it.

S6: Lazy Luke learned a lesson ... because when Barry's father gave him the load, it didn't get lighter. Then the donkey had all the sponges and it got ten times heavier.

Moose Shooting

Subject 6

Probed

S6: I think that they get the moose and they'll be happy and Jerry will send a picture to his uncle ... because it said Jerry was taking careful aim and he can aim it.

On The Spot

Subject 7

Probed

S7: He will go out and try to kill the wolf ... because he killed the dog and the Indians are coming after everybody. No he killed the lamb.

Subject 7

Probed

S7: He will go out and try to find the wolf; try to shoot him with a gun or rifle ... because it might have been her favourite lamb.

S7: Some Indians ... well to get the father and them.

S7: Her father went and her mother went. I think that the Indian might come back ... because there is only a girl and Mother and they might not know how to fight the Indians off.

S7: They will try to kill the Indian with a stick or something ... because he might try to get in the house and kill them.

S7: They'll try and get in the house and try to kill the grandmother and the girl.

S7: The Indians will think that the grandmother and the girl will be ghosts or something and they'll run away ... because the Indians don't know if it is a grandmother and a girl or not.

Lazy Luke

Subject 7

Unprobed

S7: He did not like work because it was very hard. He did it for years ... because he was lazy.

S7: Right here, he slipped into the water and the load was lighter and he could carry it. Father was mad and he was happy.

S8: He was going to do it again ... because the load was lighter the

Subject 7

Unprobed

day before when he did it.

S7: They might have started on their way to deliver more salt to some people ... because they started on their way somewhere, Luke and Barry.

S7: The surprise is that they are going to fall in the lake again ... because the salt gets heavy. They might get something to haul it with.

Moose Shooting

Subject 7

Probed

S7: They shot the moose and killed it and ate it for supper and for more suppers ... because it was big enough.

S7: He didn't kill the moose. He only shot at him but missed him.

The Most Dangerous Animal

Subject 7

Unprobed

S7: It might be a man-eating tiger ... because it says the most

Subject 7

Unprobed

dangerous thing.

S7: Because the animal might come back if they don't keep the surroundings clean ... because the animal might come around and kill them.

S7: Because the barn might be softer in the hay to raise their children ... because it's a nice soft place for a bed.

Lazy Luke

Subject 8

Unprobed

S8: I am imagining that when they take the salt to the fisherman they might not know the way ... because it just slipped into my mind.

S8: I am thinking that when he fell into the stream or river, there might be some fish in there that would bite him.

S8: I am imagining now that when Luke and Barry set out to make their deliveries, that they might get caught in some trap ... because it just came into my mind.

S8: I am thinking now that the donkey jumped right into it ... because I don't know.

S8: When Father was very angry, I am imagining that he might take a whip and slap him with it ... because it's in the story.

S8: When he slipped into the pond, I don't think he did it on purpose ... because I don't know.

Subject 8

Unprobed

S8: When the thing on his back became heavier, I am thinking he could barely walk.

Moose Shooting

Subject 8

Probed

S8: It should end when the boy gives the picture to his uncle ... it says in the story and it all sounds pretty good.

The Most Dangerous Animal

Subject 8

Unprobed

S8: I am thinking that when they go out they will be killed. Imagining that the animal will really tear them apart ... because it's in the story.

S8: I am thinking that when they feed stuff and when they feed their young, they might die of pollution ... it just slipped into my mind.

S8: When he tries to get rid of the enemy, he will take a shotgun and shoot two or three times so that he will never come back to destroy things ... I don't know why.

Subject 8

Unprobed

S8: I am thinking that when they have germs on them, they are very, very awful dirty.

S8: They fly four to five miles an hour. I am thinking of a car. If a car goes down the street, it passes them ... I don't know why.

On The Spot

Subject 8

Probed

S8: I **guess** he will hunt the wolf down ... because if I had a sheep and someone took it I'd want to find it.

S8: I think she might follow the tracks ... because if I saw tracks, I'd get pretty curious and I'd follow them to see what was at the end of those tracks.

S8: It might be an Indian on a horse ... because it said in the story about galloping and tracks.

S8: Well something might come in the house and attack Nancy and her grandmother ... because it sounds sorta scary.

S8: She might try and find a hiding spot for her and Grandmother ... because if the Indians come and catch her, she might not be living anymore.

S8: Right now I think the Indians might take them to their camp and fix them up ... because it's starting to get a little nice story now.

Subject 8

Probed

S8: I think the Indians will try and get the spots off her hands ...

because if I seen it in a picture, I would imagine that they would try to fix her up.

Grade Four
Proficient Readers

Moose Shooting

Subject 1

Unprobed

S1: They are taking a canoe out so they can get a better view ...

because they paddled slowly so they must be in a boat.

S1: I think they spotted a moose ... because it says there's a big one.

S1: Jerry has a collection of antlers so I think that they are going to take them off this moose to get them for his collection.

S1: I think that they are going to hide in the grass ... because it says they guided the boat through the tall grass in order to get a good shot.

S1: I think that they are going to get him this time ... because they shot only they missed the first time, so they'll get him this time.

S1: They got the pictures but he heard the click from the camera and got scared and ran off into the woods.

The Most Dangerous Animal

Subject 1

Probed

S1: A dragon ... because it is dangerous.

S1: Horses ... because the barn and horse stables are the places where they raise their young.

S1: A rat ... because they say garages.

S1: Now I think housefly.

On The Spot

Subject 1

Unprobed

Sl: I think that they were always frightened of the wild animals and Indians ... because they lived on the prairies and there was lots of danger.

Sl: I think that Father noticed that one of the lambs was missing. He might replace him and find another one missing the next morning.

Sl: I think that the Indians have a pack of wolves and are sending them in on the sheep ... they noticed the animal tracks and also there was the print of a moccasined foot.

Sl: I think that it is going to be an Indian and if they don't do something, he'll keep taking the sheep ... because she heard the sound of a horse coming up to the house.

Sl: I think that Nancy is going to stay home so she can investigate the tracks ... because she turned pale when she realized that she and Grandmother were alone.

Sl: She saw an Indian in the bushes so she spilled some juice on her hand and it left a red mark so she could disguise her sheep as wolves ... because the juice left a red mark on her hand.

Sl: I think that she will get Grandmother well and will try to get her down to the pasture to look after the sheep ... because when she fixed up Grandmother she placed medicine there.

Sl: She pretended to groan so that the Chief will call the pack off ... because the Chief will think that she is a sick woman with her

Subject 1

Unprobed

child in pain.

S1: I think that they put the red spots on to play mumps ... because
(He reads from book) Nancy stood up and took a step toward the
Indians. She raised her hands and pointed toward her face. The
blazing fire showed the Indians a girl and an old woman. They
were covered with bright red spots.

Lazy Luke

Subject 1

Probed

S1: I think that he'll get wet ... Luke will get wet so he won't have
to take the bags every day.

S1: I think he might try to escape or try to attack them... because
yesterday he fell in and Barry hurt himself and Father gave him a
heavy load and the donkey thought he would do it again.

S1: Tie the bags onto him so if he falls onto the stream they won't
come off ... because he thinks that the donkey is just lazy and he
is falling in to get the bags off.

S1: The wet sponges will squirt over his back and that's where the don-
key doesn't like to get wet ... because the father put in the sponges
so that the donkey wouldn't fall another time.

The Most Dangerous Animal

Subject 2

Probed

S2: A bear ... because it's big and dangerous.

S2: A wolf ... because a wolf can kill a man.

S2: Rats ... because they like to live in dirty places.

S2: A bat ... because it says wings.

S2: It's houseflies

On The Spot

Subject 2

Unprobed

S2: They might have been pioneers that lived in a forest.

S2: It was a dangerous place to live in ... because there were
Indians there.

S2: Nancy was wondering what her father was thinking.

S2: It might have been an animal ... because Nancy saw animal tracks.

S2: It might have been a person. I don't know what moccasined means...
It might have been a person trying to track an animal.

S2: It might have been an Indian ... because there was a horse galloping
up to the house.

S2: It might have been an animal that bit Mr. Blackburn's wife and made

Subject 2

Unprobed

her sick.

S2: It might have been Mr. Blackburn that killed the sheep ... because I don't know.

S2: The Indians have red war paint on their faces.

S2: They had a plan to trick the Indians.

S2: Nancy pretended that she was sick and the Indians came in.

S2: They made a picture of what they would look like with spots.

S2: The Indians were tricked because Nancy tricked them.

S2: They were afraid of smallpox.

Lazy Luke

Subject 2

Probed

S2: Luke will drown ... because he has heavy bags of salt on his back.

S2: He will jump into the lake again ... so he can get the load off his back.

S2: He will put something that won't come off in the water and he'll drown ... because he said that Lazy Luke needs to be taught a lesson.

S2: Lazy Luke will drown ... because the sponges will soak up the water and weight the donkey down more.

Moose Shooting

Subject 2

Unprobed

S2: They might be going moose hunting ... because it says our trip successful and the title is Moose Shooting.

S2: They might want to go fishing ... because they are in the water or a boat.

S2: They might be taking pictures of a moose ... because it says I'll send my uncle a picture of those.

S2: The moose was afraid of the boys ... because he hurried off into the forest.

The Most Dangerous Animal

Subject 3

Unprobed

S3: Telling about Nancy Vincent and it shows a pioneer.

S3: I think that the wolf took the lamb ... she is looking for it but I don't think they will find it.

S3: Print of a foot. She is probably thinking that a man or somebody took it.

S3: I'm wondering if they will get it.

S3: She sees a face. She might be thinking that they took her lamb.

Subject 3

Unprobed

S3: I'm wondering what her idea is about saving themselves.

S3: I'm wondering what her plan is.

Lazy Luke

Subject 3

Probed

S3: Barry will start looking for Luke ... because he fell in the stream.

S3: He will probably jump in the stream ... because he got an idea and he knew that the load got lighter.

S3: He won't let him fall into the stream ... he said he was going to teach him a lesson.

S3: The sponges will get full of water and it will be heavier for him ... it was loaded on his back.

Moose Shooting

Subject 3

Unprobed

S3: They said to make our trip successful and they are probably going to go moose shooting ... because that's what the title is.

Subject 3

Unprobed

S3: Probably going to shoot a moose ... because he pointed to a fine moose.

S3: They were just shooting with pictures ... It says well I got two good shots anyhow.

The Most Dangerous Animal

Subject 3

Probed

S3: A lion ... because he's king of the beasts.

S3: I think it's a man ... because it says keep him and his brothers out of the house.

S3: A fly, maybe ... because dirty garbage and everything.

S3: Houseflies.

Lazy Luke

Subject 4

Probed

S4: Lazy Luke might drown ... I don't ~~know~~ why.

S4: I think he'll try it again ... because he doesn't like the heavy loads of salt.

Subject 4

Probed

S4: I think Father will sell Luke ... because he's a lazy donkey.

S4: Inaudible

Moose Shooting

Subject 4

Unprobed

S4: I think they are going swimming ... because it was a beautiful
July day.

S4: They put food and supplies in the boat ... because they never
knew if they would be out long.

S4: I think. No I can't think of anything else.

S4: They'll shoot the moose ... because they took a shot at it and
they'll take another shot.

S4: I thought that they were going to shoot them but they were just
taking pictures ... because it says headed home to develop the
film.

The Most Dangerous Animal

Subject 4

Probed

S4: A buffalo ... because they weigh a ton.

Subject 4

Probed

S4: It's flies ... because they have pads on their feet and they carry germs.

On The Spot

Subject 4

Unprobed

S4: I think they faced Indians ... because they bother them.

S4: I think that Indians are going to come and attack them ...they saw a moccasin foot print.

S4: I think the Indians are going to chase the animal into the house ... because the Indians are chasing the animals.

S4: I think the Indians will attack Nancy and her grandmother ... because everyone else went out.

S4: I think Nancy will save herself from the Indians ... because she found when she poured some of the drink on her hand, it turned red.

S4: I think the plan would work ... because they had it all planned out.

S4: I think the Indian Chief might be friendly ... because the Chief came in and didn't start to fight.

S4: I think the Indians think they are sick and are going to help them. ... because the Indians saw their faces with red spots on them.

Moose Shooting

Subject 5

Probed

S5: He'll shoot the moose and send pictures to his uncle and he'll eat the moose. (Laughs) I just noticed something. He didn't even shoot. It was a camera. It went click.

The Most Dangerous Animal

Subject 5

Unprobed

S5: Must be dangerous.

S5: This mighty fellow is a most dangerous fellow.

S5: He kills people.

S5: He's got brothers and sisters and they are very dangerous I guess ... because he wants to keep them out of the house.

S5: These animals could be rats ... because it says they have to keep their house as clean as possible, because if they come in they have to be killed - mice or rats.

S5: Garbage is bad. They eat garbage. If the hawks come by, they will pick it up.

S5: They go in barns and kill horses. The horses get fewer and fewer.

S5: I told you how they carry the germs around. Well many men are dying. Here in Halifax they have the dump. All the germs are

Subject 5

Unprobed

going around.

S5: They have pads. They should keep cleaning the windows if they have rats around so they win't let the germs around.

S5: They have two wings. A bite hurts. If they bite your arm it will get infected and hurt you.

S5: They cause sickness in animals. Dangerous rats. I never knew rats have wings. They must be bats. They look like rats and act like rats.

S5: Now they are getting to the housefly. Wings beat 200 times a second.

S5: And now they are talking about us. We should help clean it and we should do something about it.

(Much later when doing comprehension test)

S5: Now I just noted that they are houseflies. They are not rats. Not nothing.

On The Spot

Subject 5

Probed

S5: He will go out shooting and try to find the wolf that ate it; or it might have been an Indian and he didn't even know ... well, because he's mad.

Subject 5

Probed

S5: She probably thinks it's an Indian and she is going to go out and find it ... because she's more worried about her father. If she doesn't find the lamb, he's going to do something about it, and he's going to make it worse.

S5: The Indians ... because he's trying to get another lamb.

S5: Nancy's mother will go and help Mrs. Blackburn and she'll stay with her grandmother. Later on when her mother comes back, she'll go out and look for tracks I guess ... because she wants to find the lamb.

S5: She'll take that bright red stuff and put it along the ground and when the Indians come see it, she'll hide. And she'll pour it on him. Then she'll yell out, "He's bleeding, he's bleeding!" ... because she wants to save them from the Indians and if she doesn't, something might happen.

S5: They think the couch is burning and they'll think she is going to burn up. Well then they just go away and leave ... well, they turn chicken and if it works then they are well.

S5: Well they'll just go over and think that they have the chicken pox or something. Because they are by the fire they'll think the couch is going to burn up. They'll leave them and let it burn. We don't want the chicken pox. We don't need them. ... well, because they don't need anything wrong with them. Like if they got chicken pox they'll think they'll get them. If they get them, they don't want them.

Lazy Luke

Subject 5

Unprobed

S5: Luke must be a donkey ... because it says get up.

S5: He has to take bags of salt to the fishermen and Luke is a lazy donkey. He doesn't like the heavy load on his back and I wouldn't like it either. I don't like carrying things. I think animals should be treated fairly.

S5: Luke slipped and fell into a stream. He must have hurt himself or something. My brother likes animals. He cares for them. But I don't think animals should have to do that. They should be treated fairly.

S5: The salt melts and went in the water. Luke is happy because he didn't have to carry it along on his back.

S5: Father is going to be mad.

S5: He liked to do stuff. The other day he was unhappy. So he got the idea and did it again.

S5: What I said last time "Do it again", well he did it another day. It was Barry's fault ... because he was making the donkey do all the work.

S5: He lost his load again and he was feeling very happy. He was finished his work for another day.

S5: Father was very, very angry. This time he taught him a lesson.

S5: Well this time when he went into the river his load got ten times heavier.

Subject 5

Unprobed

S5: Barry shouldn't have put the salt on the donkey's back in the first place. It was Barry's fault.

S5: The sponges were heavy. They shouldn't have done it in the first place.

The Most Dangerous Animal

Subject 6

Unprobed

S6: Why don't they tell what the thing is?

S6: Some kind of animal like a pig ... because a pig lives in dirty places and that animal does everything a pig does.

S6: A fly is not an animal, it's an insect.

On The Spot

Subject 6

Probed

S6: Well he'll probably plan some kind of trap in case the wolf comes back to get more sheep ... because it's not wise if you have sheep or cattle to let a wolf go killing them.

S6: Well she might follow them at her own risk ... if her father did

Subject 6

Probed

lay traps in that area she might not know it and get into them.

S6: If it's galloping, and they don't have horses, it's probably an Indian ... because they are skilled riders.

S6: Well the Indians might attack if they know the man who is the best person with the gun isn't there ... well, because Indians have sensitive ears and they might be able to hear. The grandmother is sick. She might be good at shooting but you can't do much if you are lying in bed.

S6: Well I don't know.

S6: Maybe the Indian sees that these two are harmless. Maybe they'll just take stuff and leave them alone, thinking that they were ill ... otherwise why would Nancy groan when she wasn't hurt at all, if she wasn't ill?

S6: (Laughs) Well, I think that when the Indians see the red spots, they'll think that they have measles and they'll probably flee very fast.

Lazy Luke

Subject 6

Unprobed

S6: I wonder what is going to happen to the salt. Is it going to evaporate or stay in the bag?

Subject 6

Unprobed

S6: I wonder if Father is going to whip Luke because the salt fell in the water.

S6: I wonder if the donkey is going to try to slip into the stream again so that the load will be lighter.

S6: I wonder what Father is going to do to teach the donkey a lesson.

S6: I wonder if when Luke falls into the stream the sponges are going to absorb the water and then the load will get heavier.

Moose Shooting

Subject 6

Probed

S6: Well, Jerry will probably get the moose, if he's a good shooter ... because well, he'd like those antlers for his set, so he probably shot some other moose.

On The Spot

Subject 7

Probed

S7: I think he will get a gun and kill them ... because he doesn't want them hurting lambs and sheep.

Subject 7

Probed

S7: She'll follow the Father where he went ... she wants to find out where he is going.

S7: Cowboys ... because they are coming to see what's been happening around the Vincent's house.

S7: I think Nancy will help Mr. Blackburn's wife. And after she has helped her, she will run off and help her father ... because she wants to find out the mystery why her father is looking around for the wolf.

S7: I think she will think up an idea how to track the Indians because she said she had an idea.

S7: The Indians intend to get her. And Nancy will be under Grandmother's bed to catch the Indians. Nancy is going to get very scared and run out another door ... because back in those days girls weren't very tough. They got scared at seeing any little Indian.

S7: The Indians will get scared for seeing Nancy and the old woman with red spots over them ... because Indians do not know of such things as red spots.

Lazy Luke

Subject 7

Unprobed

Subject 7

Unprobed

S7: Barry fell into the stream ... because Luke was too slow and he was going too jagged.

S7: Well I think what Luke wants to do is get Barry off the horse again so that he won't have to carry that big load over to where he is going ... the day before what happened gave him an idea.

S7: He is going to teach Luke a lesson and put so much weight on it that Luke won't be able to push it over the hill with Barry on it ... because it says I'm going to teach Luke a lesson.

S7: When Luke tips the sponges over, he is going to go with it ... because a surprise is waiting for him.

Moose Shooting

Subject 7

Probed

S7: Well, I think that they are going to catch the moose eventually, but it is going to be quite a struggle for them to get it ... they are quite young so it will be quite hard for them to get it.

The Most Dangerous Animal

Subject 7

Unprobed

Subject 7

Unprobed

S7: I think this story is about a pig or a wild boar ... because it says here that they live in dirty places.

S7: I know that these are bees now ... because the buzzing of their wings gives me the idea that it's a bee or housefly.

Lazy Luke

Subject 8

Unprobed

S8: He is probably going to try to fall in the stream again ... because he remembered the day before and will probably do it again.

S8: He is going to fall in the water ... because they said they were going to teach him a lesson.

S8: He is not going to do it again.

Moose Shooting

Subject 8

Probed

S8: Either they get the moose or it runs away ... because it might not have heard the shot or it might not get away fast enough.

The Most Dangerous Animal

Subject 8

Unprobed

S8: (No responses were made throughout the story. When asked "Did you have any thoughts while you were reading?" the subject's response was "No".

On The Spot

Subject 8

Probed

S8: Get another sheep ... because if one is gone he may need another one.

S8: Follow the tracks ... so she can go where they go.

S8: It could be the person who had found the sheep ... I don't know why I think that.

S8: Someone's going to come ... because I don't know.

S8: See who is looking out from behind the bushes ... because she is kinda curious.

S8: Nancy will start her plan ... she made it up, so when they come she'll probably do it.

S8: They'll ask why they have red spots on their faces ... I don't know.

Grade Six

Less Proficient Readers

Moose Shooting

Subject 1

Unprobed

S1: Two thirty year old men ... because they have to be a certain age to get a license.

S1: Sunshiny summer day.

S1: People around.

S1: They were twenty years old ... because it says boys.

S1: They have lots of muscles ... because they paddled a boat.

S1: It's a big thing - a moose about fifteen yards away.

S1: Jerry has a collection of antlers.

S1: His uncle is going to get a picture of the antlers he thought.

S1: They took the boat through the marsh.

S1: The moose lifted his head.

S1: Looked at Bud and Jerry.

S1: The nose twitched and Jerry took a shot.

S1: The moose ran away and almost hit them in the head with his feet.

S1: It ran off into the forest.

S1: They shot two good shots and they went home so they could develop the film.

The Most Dangerous Animal

Subject 1

Probed

Subject 1

Probed

- S1: A big hairy ape ... because it sounds dangerous.
- S1: Termites ... They have to keep everybody out of the house so that
. they won't fall through the floor.
- S1: Army ants ... because they might get killed because the army ants
will eat them.
- S1: Germs because they raise young in dirty places such as manure
piles.
- S1: Rats ... because they raise young in garbage cans.
- S1: Bees ... because they have two wings.
- S1: Mosquitoes ... because they bite and leave a great lump.
- S1: Flying ants ... because they fly fast.
- S1: Houseflies.

On The Spot

Subject 1

Unprobed

- S1: A little log cabin.
- S1: A young girl ... because she lived with her father many years ago.
- S1: Famine ... because sometimes wild animals attacked and took meat
and stuff.
- S1: Windows broken ... because when they were at war, the Indians
attacked.

Subject 1

Unprobed

S1: Rustlers - stolen lamb.

S1: Person dying ... because very sick.

S1: Big Foot ... brown face.

S1: It was an Indian ... paint on face.

S1: A plan.

S1: Indians are going to attack.

S1: Bunch of shot people ... because red spots on blankets could be blood.

S1: Bunch of Indians. Thirty miles per hour. Running through the woods.

Lazy Luke

Subject 1

Probed

S1: A donkey is going to carry down some bags of salt ... it says a donkey did not like the bags of salt.

S1: Run through the water and make all the salt melt away to nothing ... because he remembered yesterday when he lost all the salt.

S1: Get right mad at Luke and throw all kinds of stuff at him ... because they lost all the bags of salt.

S1: Luke's going to get very, very mad.

The Most Dangerous Animal

Subject 2

Probed

S2: The lion or the cougar ... because they are both fierce.

S2: It says they raise their young in horse stables. Lions and cougars don't do this. It must be horses or something.

S2: Horses don't have pads on their feet. I don't know no animal that has pads on their feet.

S2: I know what it is, a bumble bee ... because it's the fastest of flying insects and it buzzes.

On The Spot

Subject 2

Unprobed

S2: That is why wild animals attacked their cabins ... because they were pioneers.

S2: The Indians were attacking ... because it says they had to face dangers all the time.

S2: One of the lambs was missing. Wild animals were attacking sheep ... it said earlier in the story.

S2: Nancy was afraid so she searched clues. She searched around.

S2: She thought of the moccasin track ... so there must be Indians around.

Subject 2

Unprobed

S2: She thought the Indians were there.

S2: She made a plan to save them guys from the Indians ... because the berry juice left a red mark on her hand.

S2: When they made the plan, they had red spots on their face and the Indians ran up into the woods and they started to laugh.

Lazy Luke

Subject 2

Probed

S2: I think all the salt will fall out into the stream ... because he fell and slipped.

S2: I think he'll try to find the way he did it yesterday. He'll fall and slip again ... because he doesn't want to carry a heavy load.

S2: I think he'll let the donkey fall into the stream again. Then take it home and teach it a lesson. Do something to it ... because he did it on purpose. After the first load he dropped it.

S2: I think ah, I don't know what to say.

Moose Shooting

Subject 2

Unprobed

Subject 2

Unprobed

S2: They say it's a beautiful day to make a trip. That's what gave the idea of moose shooting.

S2: They wanted to get nearer to get a good shot so they could shoot the moose.

On The Spot

Subject 3

Unprobed

S3: He assumed that the lamb was killed by a wolf but maybe it just wandered off or was taken by Indians ... a wolf might have taken it but it would seem more that the Indians did because they were enemies.

S3: It says she saw many animal tracks and then she saw a moccasin track too. Maybe it was Indians.

S3: She thought of the moccasin track and her face went pale. She was worried that they'd come back ... because her mother had gone off to see a sick neighbour and she'd have to stay alone with Grand-mother.

S3: As soon as they left, she saw an Indian looking through the bushes.

S3: She had an idea. When she made the berry stuff, some spilled on her hand and stained her. She is just working out the plan and the Indian Chief just walked in.

Lazy Luke

Subject 3

Probed

S3: Maybe he won't want to work anymore since he fell when he was working ... because the donkey was lazy.

S3: He'll probably make it look as if he fell into the water again ... because it gave him an idea when he passed the brook again.

S3: Father will make him go on another trip just to teach him a lesson ... because it says the donkey should be taught a lesson.

S3: Well the sponges will get wet and get even heavier ... because when something gets wet, it gets heavier.

Moose Shooting

Subject 3

Unprobed

S3: Maybe it's a moose looking through the curtain ... because they saw something peeping through.

S3: Maybe they saw a big moose or a fish.

S3: I don't think they were going to shoot a moose. They were just taking pictures of him ... because he takes out his camera and goes fifty yards away to take a picture.

S3: I put click with I'll send a picture to my uncle and it made me

Subject 3

Unprobed

think it was just pictures.

The Most Dangerous Animal

Subject 3

Unprobed

S3: An ape, I guess ... I don't really know.

S3: Maybe snakes, poison ones ... because it says if they get in the house, you should kill them.

S3: Mice ... because they like being in dirty places.

S3: Flies ... because they can bring many diseases.

Lazy Luke

Subject 4

Probed

S4: They'll take them and he might drop the salt ... because he was lazy and did not want to carry it.

S4: Next time when he was to carry something he will drop it in the water again ... because he did it last time and got away with it.

S4: He'll make him carry it a lot longer and he'll not let him go by the water ... because he did it the last two times and it got lighter.

S4: When he falls in the water, the sponges will get heavier ...
because they absorb all the water.

Moose Shooting

Subject 4

Unprobed

S4: They noticed the sun shining through the curtains.
S4: He was greeted by the sun. Nice warm weather.
S4: The water was still. They say calm.
S4: They went through the water right smooth. Not too much noise.
S4: He pictured the antlers among his collection. They were quite big.
S4: They steered the boat through the tall grass.
S4: It says as quick as a flash. Right suddenly.
S4: They got two good shots at him. They got two good pictures from it.

The Most Dangerous Animal

Subject 4

Probed

S4: It might be a tiger ... because they can run fast and they can scratch.
S4: A bear ... because they come around to eat garbage and if you keep it
clean they won't come.
S4: It might be those things that hang upside down ... because they have
pads on their feet and hang upside down.

On The Spot

Subject 4

Unprobed

S4: Like Indians that were ready to attack them.

S4: There was a lamb missing and they thought that a wolf killed it.

S4: Her father looked strange and she looked worried.

S4: She heard a horse galloping up to the house.

S4: It was their nearest neighbour and he looked worried.

S4: They want their mother to help them for a while because his wife
is really sick.

S4: She said she'd look after her grandmother but then she decided she
couldn't because of the moccasin track.

S4: It might have been an Indian ... because it had a brown face.

S4: She thought of an idea that might save them from the Indians.

S4: She whispered the plan to Grandmother.

S4: Maybe made up as an Indian.

S4: She acted like there was something wrong with her.

S4: They had the measles and when the Indians were going to give them
medicine, they were going to try to kill them ... because the
Indians were coming and she was shouting with pain and there was
medicine there.

S4: The Indians might have thought that they were bad people and they
scared them away.

Moose Shooting

Subject 5

Probed

S5: Maybe the moose will just run away ... because every moose is afraid of man and he runs away.

The Most Dangerous Animal

Subject 5

Unprobed

S5: He kills people.

S5: Dangerous animal.

S5: They live in dirty places.

S5: They feed themselves by outdoor toilets and garbage cans.

S5: Barns and horse stables they like to raise their young.

S5: Stables must be kept clean not to raise their young in them.

S5: They can carry germs for sickness each year.

S5: On their feet pads allow them to hang onto a window pane or walk on a ceiling.

S5: Germs and dirt are often carried on these pads.

S5: They have two wings.

S5: When they bite or touch anything they leave some germs behind.

S5: The germs cause sickness in animals.

S5: They are the fastest flying insects.

On The Spot

Subject 5

Probed

S5: He might get another lamb ... because he is missing one.

S5: She might look for more clues. She might follow the moccasined foot ... she was interested in finding clues before and she is not going to give up on it.

S5: I don't know.

S5: I don't know.

S5: She'll probably find a way to stop the Indians from taking a lamb or something ... because the Indians already took onr. How do you know they won't take more for food?

S5: They'll probably **see** what's the matter with her because she is just sitting in the chair groaning, or they might just take the stuff without even paying attention to her.

S5: It's fire in her face. They'll think that she's all painted or that she's an Indian herself or that she has chicken pox or something ... because the Indian's face is red and chicken pox is red.

S5: Oh, I said chicken pox. It was smallpox.

Lazy Luke

Subject 5

Unprobed

S5: He is slow.

Subject 5

Unprobed

S5: Father takes bags of salt to fishermen.
S5: The little donkey did not like to work.
S5: He didn't like the salt on his back.
S5: He slipped and fell into a stream.
S5: The salt melted in the water.
S5: The load was much lighter.
S5: Father was not happy when he heard the salt was melted in the water.
S5: They had to go back and get more salt and it gave the donkey an
idea when they came to the river.
S5: The donkey was going to fall into the stream on purpose again.
S5: They had to go back for another trip and Father said that the lazy
donkey needs to be taught a lesson.
S5: Father put dry sponges on Luke's back.
S5: When he fell into the water, the sponges got full of water and the
load became heavier instead of lighter.
S5: Barry could not stop laughing.
S5: Father had been too smart for the donkey.
S5: Lazy Luke had been taught his lesson.

The Most Dangerous Animal

Subject 6

Unprobed

S6: This could be rats ... because they said always in garbage.

Subject 6

Unprobed

S6: They're not rats ... because there's wings. But I don't know what they are.

On The Spot

Subject 6

Probed

S6: Get another lamb ... because he is missing one.

S6: Keep looking ... because she wants to find the lamb for her father.

S6: An Indian ... because lots of Indians have horses.

S6: It was wrong.

S6: An Indian will catch her ... because of the way they are talking in the story and Nancy sounds scared too.

S6: Put some of that drink on her so the Indian can't see her ... because she wants to get away from the Indian.

S6: He will come over to Nancy ... because he is just entering the house now.

S6: The Indian will get scared of the grandmother and Nancy ... because it looks like they got burned.

Lazy Luke

Subject 6

Unprobed

S6: Father could be selling salt.

Subject 6

Unprobed

S6: He is going to drop the salt again ... because the day before he dropped it and lost the load so he might do it again.

S6: Father will give him more chores to do so that he doesn't drop it anymore ... because it says Father had other plans for Luke and Barry.

S6: He was very angry.

S6: Luke was gonna drop it in the stream again ... because it says Luke again was watching for the stream.

S6: When he falls into the stream the sponges will swell up and get heavier ... because the sponges got wet and that makes them get heavier.

S6: Now the donkey will do whatever they tell him to do and he won't drop it into the stream ... because it says Lazy Luke had learned his lesson.

Moose Shooting

Subject 6

Probed

S6: He will get the picture and the moose will run away ... because it says he takes another shot.

On The Spot

Subject 7

Probed

S7: I don't know.

S7: I think Father will go looking for the sheep ... because he needs all the food and water he can get.

S7: I don't know.

S7: Nancy will be worried until somebody comes along ... because she seen moccasin tracks.

S7: I think that she's going to pour some more berry juice on her face so the Indians will think that they're Indians too.... because when she spilled the berry juice it left a red mark on the bushes.

S7: I think they might fall for the little trick and they might not ... well, because they looked in the window and everyone came in but the Indian Chief.

S7: I think that the Indians will take the girl and the old woman back with them ... well, because the Indians will think they are sick because they have red spots on their face.

Lazy Luke

Subject 7

Unprobed

S7: I think that Lazy Luke was being a little careless ... because he

Subject 7

Unprobed

slipped and fell into the stream.

S7: I think that Lazy Luke is going to do the same thing he did before ... because he has another heavy load.

S7: I think that Lazy Luke was going to do something ... they had something planned for him.

S7: Barry is laughing so much because instead of the load getting lighter it got heavier.

Moose Shooting

Subject 7

Probed

S7: I think the moose might come over and chase him ... because the moose looked up and his ears dropped.

The Most Dangerous Animal

Subject 7

Unprobed

S7: I think here that they are carrying germs and sickness ... because they are always in sewers and places like that.

Lazy Luke

Subject 8

Unprobed

S8: Luke was a lazy donkey .

S8: They'd have to take a long walk. He didn't like heavy bags. Luke slipped and fell into the stream.

S8: His father was not happy.

S8: This was a day for Luke to deliver things.

S8: The donkey had a good memory.

S8: Luke fell into the water again.

S8: The load got heavier on his back this time.

S8: The market was a long way from his house ... because the donkey didn't want to walk down there all the time.

Moose Shooting

Subject 8

Probed

S8: They are going to catch a moose ... because they took a shot at one.

The Most Dangerous Animal

Subject 8

Unprobed

S8: It's a dangerous hunt ... because it said it's the most dangerous

Subject 8

Unprobed

animal.

S8: It kills for no reason ... because it said if his brothers went in the house they'd be sure to be killed.

S8: It was hungry ... because it tears the garbage bags open.

S8: The stables must be kept clean so that they can't raise their young.

S8: This animal is a rat ... because it carries germs.

On The Spot

Subject 8

Probed

S8: Go look for the wolf ... because he killed the sheep.

S8: She looks for the animal tracks. Then she saw the moccasin thing so she'll look for the Indians ... so she can get the sheep.

S8: I think the Indians ... because she saw the moccasin track before.

S8: Indians will attack ... because everybody left except Nancy and her grandmother.

S8: Run back to her grandmother ... because of the Indians.

S8: I don't know.

S8: The Indian Chief will take her to the village ... because she is painted like an Indian.

Grade Six

Proficient Readers

Moose Shooting

Subject 1

Unprobed

S1: I am thinking that he is probably going out somewhere and do something good ... because of the July day.

S1: He will kill the moose and get the antlers ... because he said a fine set of antlers and pictured them among his collection.

S1: He heard the sound of the gun, I guess. He will probably run away.

S1: He shot the moose but he might have missed it because the moose probably moved a little bit.

The Most Dangerous Animal

Subject 1

Probed

S1: Oh I don't know. A lion or a tiger ... because it is dangerous.

S1: It might be insects ... because lions and tigers I don't think people would keep in the house.

S1: Oh it might be a mouse or a rat ... because they kind of feed and raise their young in garbage.

S1: Oh, it has two wings so it's probably a fly.

On The Spot

Subject 1

Unprobed

S1: He might go and try to find the wolf that killed the sheep ... I just thought he might look for it.

S1: She'll probably investigate the animal and the tracks ... because she's curious to find out what it is.

S1: It might be her father coming home ... remember it said he went away.

S1: They'll probably stay in the house ... because she's probably scared that whoever made the moccasin track will come back.

S1: She'll probably put more drink on her to pretend that she is bleeding and they'll leave her alone ... because I think if the Indians see you hurt, then they don't kill you.

S1: The Indians will probably come into the house and Nancy will probably do something with the bottles ... because she had bottles lined up by the fireplace.

S1: The Indians will probably see that she's hurt badly and feel sorry ... because she looks badly hurt.

S1: The Chief will see that they got some bad disease. She will pick up the bottle when he is not looking and put some stuff on him. He might think that he's catching it thenthey had red spots all over them and the bottles are there.

Lazy Luke

Subject 1

Probed

S1: Oh the donkey might go back to his father and Father might come and help the little boy ... well, the little boy, that's his donkey and he probably cares about it.

S1: Well, he'll probably just crawl out ... because the load was much lighter. All the salt melted in the water and made it much easier to get out.

S1: He'll probably give him twice as much load ... because the donkey needs to be taught a lesson. He'll give him a whole bunch to carry.

S1: The sponges will soak up the water and make the load heavier ... because there was a surprise in it for Luke. The sponges will soak up the water and that is the thing that Father was getting to.

The Most Dangerous Animal

Subject 2

Probed

S2: A wolverine or a badger ... because they are dangerous.

S2: I think it's a rat ... because they say it's in dirty places and garbage heaps.

Subject 2

Probed

S2: Now it's flies ... because they have little sticky pads and they have wings.

S2: It must be a mosquito ... because they carry malaria.

On The Spot

Subject 2

Unprobed

S2: I think it's a fox that took one of the lambs ... because it's a lamb that's missing. Foxes usually take lambs.

S2: It must be an Indian that took the lamb ... because she said there was a moccasined foot.

S2: Nancy is scared ... because she thought of the moccasin track and she and Grandmother are alone.

S2: She went and saw the animal. She's gonna hafta find a way to save them from the Indians or else get killed.

S2: They are coming in and she must have a good plan ... because they are not really worried. They must be gonna out-smart them somehow ... because they got the bottles out and things. They don't have any weapons so they have to do something.

S2: She's gonna out-smart them by saying an Indian girl and an old lady has chicken pox ... they have red spots. Like it must be that.

Lazy Luke

Subject 2

Probed

S2: The boy will try to get Luke out of the stream well, he's gonna get the salt so he's got to get him out of there.

S2: He is gonna probably go into the stream again ... because he wants to lessen the weight.

S2: Father will put in something that can't spill out or melt and he'll have to still carry it ... because he's gonna teach him a lesson.

S2: The sponges will fill up with water and get heavier and the donkey will have an awful surprise ... because he thought it would lighten the load instead of weighting him down more.

Moose Shooting

Subject 2

Unprobed

S2: The boys are gonna leave on a trip ... because it says Moose Shooting so they must be gonna hunt for moose.

S2: Jerry is gonna try to shoot the moose and get the antlers and take a picture of the antlers for his uncle.

S2: Jerry took careful aim and shot so he probably got the moose.

S2: Oh, I thought they were going shooting but they were just taking pictures.

On The Spot

Subject 3

Unprobed

S3: In the story it says they faced dangers and I think about some of the disadvantages they had, like cold, sickness and animals.

S3: Indians waiting to attack. I think about history when the United States and the Indians were fighting over territories.

S3: Father went into the woods to work. It makes me think of about if they went in cutting wood and doing jobs like that.

S3: So far when I'm reading the story, I just try to picture the scenery around it and what's happening.

S3: Because I can remember once when I was small I saw a program like that.

S3: As I'm reading this I wonder what the plan will be to stop the Indians.

S3: When I'm reading what her plan was, I think about how superstitious Indians used to be. How they didn't know what diseases white man had.

Lazy Luke

Subject 3

Probed

S3: Well, he'll lose the salt bags and might break a leg or something because it said walking along slowly. The pack might be heavy so he'll try to lose the salt bags.

Subject 3

Probed

S3: He'll **fall** down again and try to get the bags wet ... because it worked for him before and he'll try the plan again.

S3: I think instead of putting salt in the bags, he'll put rocks or something ... because when the donkey tries that stunt again, puts the bags in the water again, the rocks won't dissolve.

S3: The sponges are going to absorb all the water and he'll have a heavier load ... well, sponges just gather water.

Moose Shooting

Subject 3

Unprobed

S3: They are going hunting moose ... the title says Moose Shooting.

S3: He will kill the moose and take a picture of the antlers for his uncle ... he has killed moose before; he has a collection.

S3: Oh, they are only taking pictures. They are not shooting with a gun ... because the camera went click.

The Most Dangerous Animal

Subject 3

Probed

S3: A bear ... because bears are big. They have big claws and are

Subject 3

Probed

tough.

S3: A vulture ... because they always hang around garbage and that.

S3: A bird ... because of the wings.

Lazy Luke

Subject 4

Probed

S4: Ah, Barry will probably run in and try to get Luke up in the water to get the salt off his back and get him out of the water and try to save the salt ... well, Barry wouldn't want Luke to die or something like that. And if he was trying to get Luke up and go back for salt, he probably wants the salt because they must be getting paid for selling it or something. I don't know. They wouldn't want to lose it.

S4: I don't know, probably try to get back at Barry and push him into the water or something like kicking him ... probably because Luke thought Barry was trying to make him carry more than he thought. Try to make him sorta say Luke did something to him. Try to get back even with him.

S4: Probably make him take another route and make him carry just as much.

S4: Luke will probably float because of the sponges ... the sponges will make him float.

Moose Shooting

Subject 4

Unprobed

S4: They are making a trip and the title is Moose Shooting, so they are going moose hunting.

S4: It says a fine set of antlers. Jerry was picturing them among his collection. So they must have been moose hunting before.

S4: Here it says click. So it means they took a picture of him for his uncle.

The Most Dangerous Animal

Subject 4

Probed

S4: Probably a lion ... because lions are dangerous.

S4: I think they are rats ... because they carry germs and raise their young on manure piles.

On The Spot

Subject 4

Unprobed

S4: Could be that they lived at the edge of the woods and Indians

Subject 4

Unprobed

could attack ... well, because it says that they faced dangers.

S4: The animals and the Indians must have lived back in the woods a bit if they could find the cabin. They were trained to attack.

S4: They found animal tracks and the print of a moccasin. Must mean that the Indians have the wolves trained to attack ... because they must have been friends.

S4: It must mean that her father came back or an Indian came to attack or get another animal somehow.

S4: It says Mr. Blackburn was worried. His house might have been torn down or an animal killed or his wife taken away by Indians or something.

S4: She was probably thinking that the Indians would attack their home.

S4: Here it says she saw the Indian. The red drink on her hand might make her paint her face like an Indian ... because it made marks on her hand. She could put marks on her face like war paint.

S4: Here it says to help her. She might want to put paint on herself too and make them both look like Indians or witch doctors ... well, because it said she placed bottles of medicine.

S4: Here it says stretched out in a chair. She could be pretending she was sick and Grandmother was a witch doctor trying to cure her.

S4: Here it must mean that they think they have chicken pox or something ... well, because when you have chicken pox, you have red spots on your face. That's what she did. She put red spots on from the

Subject 4

Unprobed

drink she was making. She put red spots on her face.

Moose Shooting

Subject 5

Probed

S5: I'd say they are going to take pictures and the moose got scared at first; then, instead of running away when he found out they weren't going to hurt him, he stayed and got curious ... because it said his ears stood up and he turned around and looked at them.

The Most Dangerous Animal

Subject 5

Unprobed

S5: He must be a big animal or long ... because it said he's the most dangerous animal in the world. Some things, of course, don't have to be big to be dangerous.

S5: Whatever it is might be inside the house. It must be either inside the house and the people outside or it's outside and the people are inside.

S5: They seem to be not a very clean animal. The people are trying to

Subject 5

Unprobed

keep everything clean around the house so it said to get rid of them.

S5: I think that because garages are cleaner there are not too many of these animals left. It would probably be quite hard to keep the barn clean for them to raise young.

S5: It seems that there might be medicine for the disease that the germs they carry cause ... because it says the germs are carried on their foot pads.

S5: It's an insect. That's all I really know.

On The Spot

Subject 5

Probed

S5: He thought that the sheep had been killed by a wolf so I don't think he'll be able to do much.

S5: She is going to go looking for the sheep ... because she found moccasin prints and she thinks that someone took it.

S5: I think it could be the father.

S5: I think someone will come and hold them in the house ... well, the neighbour came. His wife was sick so Mother had to go. Nancy said that she would look after Grandmother.

Subject 5

Probed

S5: She'll paint her face and her grandmother's face so they'll look like Indians themselves when they come into the house ... because the idea came to her when she found the red spot on her hand from the drink.

S5: She's lying on the couch as though she's sick and the Indians have come in one behind the other and the chief Indian thinks (if I'm right she has the war paint on) and makes it look like a sick Indian.

S5: The Indians I think they'll probably think they both have smallpox or chicken pox or something and they'll run. They're scared ... because they groaned and they both have paint on their faces with spots all over them.

Lazy Luke

Subject 5:

Unprobed

S5: They were a lazy donkey and quite slow. They expect him to carry bags of salt down around maybe the wharf or something.

S5: He fell into the stream with the salt on his back. The salt will go into the stream and maybe get a little impure.

S5: I think he decided to fall in again ... he got an idea when he saw

Subject 5

Unprobed

the stream where he was yesterday and fell in.

S5: He fell in on purpose this time and lost most of his load the same as the day before. Then he was happy his load was lighter and he was almost finished.

S5: Father was angry. He was catching on that Luke was doing it on purpose. So I don't think that he is going to let him go again ... because well, twice in a row. Sometimes you can fall in twice, but not usually two days right in a row that an animal falls in the stream.

S5: Luke had sponges in the sack this time ... when the sponges get wet and you have so many of them, they can get quite heavy. He's going to fall in the stream on purpose again and the sponges will get really heavy.

The Most Dangerous Animal

Subject 6

Unprobed

S6: He might be a bear or something ... because he's an animal and he's dangerous.

S6: Yes, a bear ... because he is the cause of many deaths.

S6: They might be rats or something ... rats like dirty places.

S6: This might be something about not having too much pollution or any

Subject 6

Unprobed

garbage.

S6: I think they might be fleas or something ... because they walk on the ceiling.

S6: I think it's telling people not to throw dirt or garbage around.

On The Spot

Subject 6

Probed

S6: I think he'll try to find out who killed the lamb ... because anybody would who lost a lamb.

S6: I think she'll wonder about the moccasined foot mark ... because it says there was the print of a moccasined foot.

S6: The Indians ... because it says she heard the sound of a horse galloping up to the house.

S6: I think the Indians might come to the house and raid it or something. ... because, oh I don't know.

S6: I think that she will put some of the drink on her and make it look like blood ... because it says an idea came to her and there's a bright red mark.

S6: I think the Chief might feel sorry for her pretending to be sick with blood or something. And then they are going to help her or something ...because it says painted faces stared from outside and

Subject 6

Probed

then the Chief came in.

S6: The Indians probably will get out of the house as fast as they can because of chicken pox or something ... because it says covered with bright red spots.

Lazy Luke

Subject 6

Unprobed

S6: I think Luke must be a person because he wants to carry the bags of salt to the fishermen.

S6: I was wrong. He's not a person; he's a donkey.

S6: He must be clumsy ... because he slipped and fell into the stream.

S6: The donkey got an idea, maybe to take a wider sweep around the stream ... because it says this gave him an idea. He remembered what had happened the day before.

S6: He is naughty and doesn't like work. Ah, he's too lazy ... because he fell into the stream on purpose the second time.

S6: Father had other plans. He was going to give him another job so Luke won't fall into the stream on purpose ... because it says this time he was very angry and he had other plans.

S6: Father put dry sponges into the sack. When he falls into the stream,

Subject 6

Unprobed

they swell up and get heavier ... because it says he put some dry sponges into the sack.

Moose Shooting

Subject 6

Probed

S6: I don't know, I think the moose will get away or something ... I don't know.

On The Spot

Subject 7

Probed

S7: I think he'll probably scout around to see if he can find any bones or anything to make sure that it was killed by a wolf ... because well, I guess because of the Indians and he wants to know if it was the Indians that took it. And he wants to go to the Indians and tell them to give it back. Or make sure it was killed by a wolf so he wouldn't have to go to the Indians.

Subject 7

Probed

S7: She'll try to investigate and if she finds any more clues, she'll go to the Indian before her father or meet her father at the camp ... because it says she looked for clues so I think she'll look until she can solve the mystery and help her father.

S7: I think it might be one of the men telling that the Indians are going to have a massacre or going to attack the town, something like that ... because it said they were at war with the Indians and galloping up to the house awful fast, it must be something urgent.

S7: I think Nancy might bundle up her grandmother and leave her there and might go to the Indians and ask for help. Or like try to get some help from the Indians so she could sorta stop like the massacre before it happened ... because it sounds like Nancy is a pretty daring girl and her grandmother might even get sicker and Nancy won't be able to go to her mother or anything. So she just might have to go to the Indians for help.

S7: I think she might dress up as an Indian. Then she'll guard the house so the Indians won't attack other Indians. So she'll protect the house dressed up like Indians.

S7: Nancy is going to say that they are both sick and that her grandmother is even worse and she wants them to help her cure her, so that she can keep the Indians there and save the rest of the town and her house ... because when she sat down on the chair and groaned

Subject 7

Probed

really loud and behaved that she was sick and her grandmother is sick and the medicine. She's got to do something.

S7: I think Nancy is going to pretend that she is sick with smallpox and that's what the Indians are afraid of. And she's going to make the Indians go away because they're afraid of smallpox or any disease that the white man brings over because they can die from it very easy. Because Nancy wants to save her house and she's all covered with red spots, so it would have to be something that Indians are afraid of and they're afraid of smallpox.

Lazy Luke

Subject 7

Unprobed

S7: Luke fell in the stream because he had too much salt on his back.

He was only a little donkey so that's not quite fair.

S7: He might drop it again in the river or something. When he came to the river this gave him an idea. He's probably going to drop it in the river again and get Father really mad and he might get beaten ... because he remembered what had happened the day before and that gave him an idea. So he's going to try to get it off his back again and that's the only way he knows how to.

Subject 7

Unprobed

S7: Father might be at the river and beat Luke so he won't go into the river again. I hope he doesn't ... because he sounds pretty angry and he's losing all his work. Because he's losing all his salt in the river. He might beat him just to make sure he doesn't do it again.

S7: When Luke falls into the river with the dry sponges, the sponges will probably get all wet and drag him down to the bottom. So he's going to go down to the bottom.

Moose Shooting

Subject 7

Probed

S7: I think Jerry is going to kill the moose and that he will get a good set of antlers and send a picture to his uncle ... because he's only fifty feet away and he's a pretty good shooter because he already has a good collection of antlers, so I don't see how he could miss.

The Most Dangerous Animal

Subject 7

Unprobed

Subject 7

Unprobed

S7: Ferocious lion ... it says the most dangerous animal in the world.

S7: Wild pig ... it raises its young in the manure.

S7: It has two wings and can bite something and can hang upside down.

It sounds like a bat or something.

Lazy Luke

Subject 8

Unprobed

S8: I think that Luke is going to be real lazy ... because the title said lazy and he had to carry bags of salt to fishermen.

S8: Here it says he did not like to work.

S8: I think Luke fell into the stream because he didn't want to carry the bags of salt ... because it says he went slowly along and sorta slipped.

S8: Here it says he was happy because the load was lighter.

S8: I think he is going to try to fall into the stream again so the load will be lighter ... because he says that gave him an idea when he walked by the stream.

S8: He fell into the stream here and got really happy.

S8: I think Father is going to whip Luke ... because it says Father was

Subject 8

Unprobed

really angry when he found out about Luke and Barry.

S8: He is going to make Luke keep on doing it until he does it right in the end ... because it says to get Luke ready for another trip because he has to be taught a lesson.

S8: I think Luke is going to fall into the stream again and try to get out of it ... well, because he is lazy and probably won't do it.

S8: I think he is going to get in trouble and have to carry something that's really worth nothing, just to teach him a lesson ... because it says a surprise is waiting for Luke.

S8: They finally taught him a lesson because the load became heavier.

S8: I think the donkey would be really mad because his plan didn't work that time.

Moose Shooting

Subject 8

Probed

S8: They will either shoot the moose or the moose will get away before they get a chance to hit it ... because it said he took careful aim and shot.

The Most Dangerous Animal

Subject 8

Unprobed

S8: I think of a great big fuzzy scary thing ... because it is called the most dangerous so would be big and probably fuzzy.

S8: I think that they'd eat humans ... because they try to keep them out of the house. And if they get in, they kill them.

S8: I think the animals like dirty places that's all wrecked and everything ... because they probably eat all the yucky food that people throw out. That's why they come around people's houses.

S8: I think the animals must be getting mad ... well, because they can't raise their young in the stables. They keep cleaning them out to keep them away.

S8: I think they have a whole bunch of germs and dirt ... because they live in dirty old places and probably catch all the germs and their feet have pads. So that would catch dirt on them too.

S8: They try to keep the animals away ... because they can kill their animals and kill them too.

S8: Their wings beat about two hundred times a second. It makes me think how fast they must be going.

On The Spot

Subject 8

Probed

Subject 8

Probed

S8: He'll try and go out and find it in the woods ... because he can't say it was killed by a wolf before he looked for it.

S8: She'll look to see who wears moccasins and ask them where they were last night ...because if she wants to find out who did it, she will have to go around through town.

S8: A man coming up to visit them to see what was wrong, or it could be the man who took the sheep ... because someone should be riding the horse and the man might be coming back to look for more sheep or another animal.

S8: Nancy will go look after his wife and he'll probably take some more animals ... because her face paled when she saw the moccasin track.

S8: She will probably go warn her Father that she thought she saw some Indians in the bushes ... because it says there might be a way to save them from the Indians.

S8: The Indians will come in and take the medicine ... because they saw that Nancy was pretending to be sick.

S8: The Indians will run because they think that they are sick ... because some of the diseases we get Indians can die easily from.

APPENDIX G

Three-Way Analysis of Variance on Selected Variables
by Grade, Group and Treatment
for Two Stories (DA & LL)

Table G.1

Three-Way Analysis of Variance on Selected Variables
by Grade, Group and Treatment for DA & LL

1. Variable: Number of Predictions						
*Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	4.50	1	4.50	1.19	.2868	N.S.
B	21.13	1	21.13	5.57	.0267	Sig.
AB	32.00	1	32.00	8.44	.0077	Sig.
C	105.12	1	105.12	27.72	.0000	Sig.
BC	45.12	1	45.12	11.90	.0020	Sig.
AC	2.00	1	2.00	.53	.4747	N.S.
ABC	8.00	1	8.00	2.11	.1593	N.S.
Errors	91.00	24	3.79			
2. Variable: Appropriate Predictions						
Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	13.78	1	13.78	3.66	.0675	N.S.
B	38.28	1	38.28	10.18	.0039	Sig.
AB	5.28	1	5.28	1.40	.2476	N.S.
C	57.78	1	57.78	15.37	.0006	Sig.
BC	34.03	1	34.03	9.05	.0060	Sig.
AC	1.53	1	1.53	.41	.5294	N.S.
ABC	16.53	1	16.53	4.39	.0467	Sig.
Errors	90.25	24	3.76			
3. Variable: Plausible but Unlikely Predictions						
Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	.13	1	.13	.43	.5189	N.S.
B	1.13	1	1.13	3.86	.0612	N.S.
AB	1.13	1	1.13	3.86	.0612	N.S.
C	1.13	1	1.13	3.86	.0612	N.S.
BC	.13	1	.13	.43	.5189	N.S.
AC	.13	1	.13	.43	.5189	N.S.
ABC	.13	1	.13	.43	.5189	N.S.
Errors	7.00	24	.29			

* A - Grade

B - Group

C - Treatment

4. Variable: Inappropriate Predictions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	1.53	1	1.53	2.01	.1687	N.S.
B	.28	1	.28	.37	.5487	N.S.
AB	5.28	1	5.28	6.95	.0145	Sig.
C	2.53	1	2.53	3.33	.0806	N.S.
BC	.28	1	.28	.37	.5488	N.S.
AC	.28	1	.28	.37	.5488	N.S.
ABC	.78	1	.78	1.03	.3209	N.S.
Errors	18.25	24	.76			

5. Variable: Supported Responses

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	10.13	1	10.13	1.79	.1922	N.S.
B	.13	1	.13	.02	.8827	N.S.
AB	21.13	1	21.13	3.76	.0645	N.S.
C	45.12	1	45.12	8.02	.0092	Sig.
BC	15.13	1	15.13	2.69	.1141	N.S.
AC	6.13	1	6.13	1.09	.3071	N.S.
ABC	10.13	1	10.13	1.79	.1923	N.S.
Errors		24	5.63			

6. Variable: Cognitive Memory Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	10.13	1	10.13	.37	.5497	N.S.
B	40.49	1	40.49	1.47	.2367	N.S.
AB	18.00	1	18.00	.65	.4264	N.S.
C	128.00	1	128.00	4.65	.0412	Sig.
BC	21.13	1	21.13	.77	.3895	N.S.
AC	18.00	1	18.00	.65	.4264	N.S.
ABC	15.13	1	15.13	.55	.4655	N.S.
Errors		24	27.50			

7. Variable: Convergent Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	.13	1	.13	.04	.8481	N.S.
B	8.00	1	8.00	2.39	.1344	N.S.
AB	8.00	1	8.00	2.39	.1344	N.S.
C	21.13	1	21.13	6.34	.0189	Sig.
BC	2.00	1	2.00	.59	.4462	N.S.
AC	.13	1	.13	.04	.8481	N.S.
ABC	4.50	1	4.50	1.35	.2567	N.S.
Errors	80.00	24	3.33			

8. Variable: Divergent Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	4.50	1	4.50	2.88	.1026	N.S.
B	28.13	1	28.13	17.99	.0003	Sig.
AB	4.50	1	4.50	2.88	.1026	N.S.
C	4.50	1	4.50	2.88	.1026	N.S.
BC	4.50	1	4.50	2.88	.1026	N.S.
AC	3.13	1	3.13	1.99	.1702	N.S.
ABC	6.13	1	6.13	3.92	.0593	N.S.
Errors	37.50	24	1.56			

9. Variable: Evaluative Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	.13	1	.13	.04	.8348	N.S.
B	1.13	1	1.13	.39	.5331	N.S.
AB	2.00	1	2.00	.71	.4074	N.S.
C	15.13	1	15.13	5.38	.0292	Sig.
BC	4.50	1	4.50	1.60	.2181	N.S.
AC	0.00	1	0.00	0.00	1.0000	N.S.
ABC	1.13	1	1.13	.39	.5330	N.S.
Errors		24	2.81			

10. Variable: Comprehension of Stories

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	36.13	1	36.13	10.90	.0030	Sig.
B	66.13	1	66.13	19.95	.0002	Sig.
AB	12.50	1	12.50	3.77	.0639	N.S.
C	3.13	1	3.13	.94	.3412	N.S.
BC	12.50	1	12.50	3.77	.0639	N.S.
AC	2.00	1	2.00	.60	.4448	N.S.
ABC	10.13	1	10.13	3.06	.0933	N.S.
Errors	79.53	24	3.31			

APPENDIX H

Three-Way Analysis of Variances on Selected Variables by Grade, Group and Treatment for Two Stories (MS & OS)

Table H.1

Three-Way Analysis of Variance on Selected Variables
by Grade, Group and Treatment for MS & OS

1. Variable: Number of Predictions						
Source*	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	2.53	1	2.53	.17	.6878	N.S.
B	185.28	1	185.28	12.11	.0019	Sig.
AB	13.78	1	13.78	.90	.3521	N.S.
C	81.28	1	81.28	5.31	.0301	Sig.
BC	13.78	1	13.78	.90	.3521	N.S.
AC	5.28	1	5.28	.35	.5624	N.S.
ABC	11.28	1	11.28	.74	.3990	N.S.
Errors	367.25	24	15.30			
2. Variable: Appropriate Predictions						
Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	3.78	1	3.78	.26	.6181	N.S.
B	205.03	1	205.03	13.83	.0011	Sig.
AB	19.53	1	19.53	1.32	.2623	N.S.
C	22.78	1	22.78	1.54	.2271	N.S.
BC	7.03	1	7.03	.47	.4976	N.S.
AC	5.28	1	5.28	.36	.5562	N.S.
ABC	9.03	1	9.03	.61	.4427	N.S.
Errors	355.75	24	14.82			
3. Variable: Plausible but Unlikely Predictions						
Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	.13	1	.13	.21	.6533	N.S.
B	.13	1	.13	.21	.6533	N.S.
AB	.13	1	.13	.21	.6533	N.S.
C	2.00	1	2.00	3.31	.0813	N.S.
BC	.50	1	.50	.83	.3720	N.S.
AC	0.00	1	0.00	0.00	1.0000	N.S.
ABC	.50	1	.50	.83	.3720	N.S.
Errors	14.50	24	.60			

* A - Grade

B - Group

C - Treatment

4. Variable: Inappropriate Predictions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	0.00	1	0.00	0.00	1.0000	N.S.
B	.13	1	.13	.26	.6142	N.S.
AB	.13	1	.13	.26	.6142	N.S.
C	8.00	1	8.00	16.69	.0004	Sig.
BC	.13	1	.13	.26	.6142	N.S.
AC	0.00	1	0.00	0.00	1.0000	N.S.
ABC	.13	1	.13	.26	.6142	N.S.
Errors	11.50	24	.48			

5. Variable: Supported Responses

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	.78	1	.78	.17	.6824	N.S.
B	30.03	1	30.03	6.59	.0169	Sig.
AB	1.53	1	1.53	.34	.5673	N.S.
C	.78	1	.78	.17	.6824	N.S.
BC	38.28	1	38.28	8.41	.0079	Sig.
AC	.28	1	.28	6.18	.8058	N.S.
ABC	3.78	1	3.78	.83	.3712	N.S.
Errors	109.25	24	4.55			

6. Variable: Cognitive Memory Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	.78	1	.78	.04	.8441	N.S.
B	81.28	1	81.28	4.11	.0538	N.S.
AB	19.53	1	19.53	.99	.3301	N.S.
C	215.28	1	215.28	10.89	.0030	Sig.
BC	69.03	1	69.03	3.49	.0739	N.S.
AC	.78	1	.78	.04	.8441	N.S.
ABC	19.53	1	19.53	.99	.3301	N.S.
Errors	474.25	24	19.76			

7. Variable: Convergent Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	2.53	1	2.53	.63	.4347	N.S.
B	2.53	1	2.53	.63	.4347	N.S.
AB	2.53	1	2.53	.63	.4347	N.S.
C	63.28	1	63.28	15.78	.0006	Sig.
BC	1.53	1	1.53	.38	.5425	N.S.
AC	3.78	1	3.78	.94	.3412	N.S.
ABC	1.53	1	1.53	.38	.5425	N.S.
Errors	96.25	24	4.01			

8. Variable: Divergent Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	1.13	1	1.13	.28	.6017	N.S.
B	49.99	1	49.99	12.44	.0017	Sig.
AB	.13	1	.13	.03	.8615	N.S.
C	71.99	1	71.99	17.90	.0003	Sig.
BC	18.00	1	18.00	4.48	.0449	Sig.
AC	.13	1	.13	.03	.8615	N.S.
ABC	6.13	1	6.13	1.52	.2291	N.S.
Errors	96.50	24	4.02			

9. Variable: Evaluative Productions

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	3.78	1	3.78	4.37	.0472	Sig.
B	7.03	1	7.03	8.13	.0088	Sig.
AB	1.53	1	1.53	1.77	.1958	N.S.
C	11.28	1	11.28	13.05	.0014	Sig.
BC	1.53	1	1.53	1.77	.1958	N.S.
AC	11.28	1	11.28	13.05	.0014	Sig.
ABC	7.03	1	7.03	8.13	.0088	Sig.
Errors	20.75	24	.86			

10. Variable: Comprehension of Stories

Source	S.S.	D.F.	M.S.	F-Ratio	Prob.	Decision
A	2.53	1	2.53	.84	.3684	N.S.
B	57.78	1	57.78	19.19	.0002	Sig.
AB	13.78	1	13.78	4.58	.0428	Sig.
C	.28	1	.28	.09	.7625	N.S.
BC	.78	1	.78	.26	.6152	N.S.
AC	.28	1	.28	.09	.7625	N.S.
ABC	1.53	1	1.53	.51	.4827	N.S.
Errors	72.28	24	3.01			

APPENDIX I
Correlation Coefficients

Table I.1

Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 4 Probed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.719**	.662**	-.321	-.031	-.458	-.374	-.628**	.538*	-.052	-.301	.078	-.453
2. Vocabulary (C.T.B.S.)			.874***	-.169	.137	-.464	-.420	-.534*	.830***	-.280	-.415	.200	-.377
3. Comprehension (C.T.B.S.)				.291	.476	-.476	-.625**	-.442	.846***	-.215	-.350	.201	-.374
4. Number of Predictions				.851***	-.132	-.132	.421	.495	-.089	-.198	-.180	.403	.007
5. Appropriate Predictions					-.509*	-.509*	-.046	.311	.233	-.324	-.283	.420	-.103
6. Plausible Predictions							.218	.008	-.299	.055	.052	-.006	.139
7. Inappropriate Predictions								.434	-.591*	.291	.234	-.063	.174
8. Total Supported Responses									-.407	.321	.536*	-.191	.527*
9. Comprehension of Stories										-.481	-.375	.295	-.273
10. Cognitive Memory Productions											.681**	-.732***	.185
11. Convergent Productions												-.854***	.671*
12. Divergent Productions													-.619**
13. Evaluative Productions													

* p < .05 ** p < .01 *** p < .001

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

Table I.2

Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 4 Unprobed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.719**	.662**	.261	.332	.176	-.390	-.025	.502*	-.159	-.277	.410	-.420
2. Vocabulary (C.T.B.S.)			.874***	.392	.505	-.110	-.219	-.162	.795**	-.181	-.483	.536*	-.206
3. Comprehension (C.T.B.S.)				.310	.387	.053	-.258	.152	.819***	.193	-.593*	.448	-.105
4. Number of Predictions					.969***	.392	.350	.754***	.371	-.296	.138	.903***	-.159
5. Appropriate Predictions						.227	.196	.702**	.463	-.289	.050	.918***	-.136
6. Plausible Predictions							.000	.274	-.017	-.130	.296	.227	-.218
7. Inappropriate Predictions								.436	-.218	-.080	.213	.234	.021
8. Total Supported Responses									.182	-.212	.034	.695**	.005
9. Comprehension of Stories										.186	-.492	.592	.171*
10. Cognitive Memory Productions											-.275	-.257	.450
11. Convergent Productions												-.028	.068
12. Divergent Productions													-.214
13. Evaluative Productions													

* p < .05 ** p < .01 *** p < .001

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

Table I.3

Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 6 Probed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.720**	.522*	.592*	.603*	-.044	-.038	-.161	.265	-.154	-.191	.393	-.235
2. Vocabulary (C.T.B.S.)			.869***	.488	.538*	-.161	-.084	-.035	.183	-.173	-.087	.384	-.515*
3. Comprehension (C.T.B.S.)				.451	.570*	-.180	-.311	.095	.360	-.080	.089	.236	-.555*
4. Number of Predictions					.926***	-.031	-.235	.248	-.094	-.065	-.103	.544*	-.305
5. Appropriate Predictions						-.297	-.088	.289	.103	-.027	.033	.450	-.364
6. Plausible Predictions							.188	-.089	-.301	.071	-.120	-.029	.347
7. Inappropriate Predictions								-.090	-.471	-.382	-.390	.330	-.038
8. Total Supported Responses									.031	.492	.710**	-.354	.047
9. Comprehension of Stories										.231	.361	-.437	.048
10. Cognitive Memory Productions											.574*	-.507*	.112
11. Convergent Productions												-.755***	-.088
12. Divergent Productions													-.226
13. Evaluative Productions													

* $p < .05$ ** $p < .01$ *** $p < .001$

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

Table I.4

Intercorrelation Matrix for Scores of Standardized Tests and Ten Dependent Variables^a for Grade 6 Unprobed (N = 16)

Variable	1	2	3	4 ^a	5	6	7	8	9	10	11	12	13
1. I.Q.		.720**	.522*	.292	.299	-.352	.109	.144	.599*	-.306	-.057	.280	.175
2. Vocabulary (C.T.B.S.)			.869***	.631**	.622**	-.357	.285	.518	.645**	-.543*	.111	.584*	.089
3. Comprehension (C.T.B.S.)				.670**	.648**	-.201	.331	.557*	.624**	-.469	.250	.619**	-.194
4. Number of Predictions					.992***	-.172	.185	.657**	.349	-.514*	.025	.899***	-.129
5. Appropriate Predictions						-.256	.067	.639**	.329	-.500*	-.004	.882***	-.124
6. Plausible Predictions							.333	-.200	.074	-.029	-.030	-.190	-.016
7. Inappropriate Predictions								.297	.169	-.134	.297	.279	-.047
8. Total Supported Statements									.175	-.442	.391	.618**	.081
9. Comprehension of Stories										.312	-.123	.365	-.186
10. Cognitive Memory Productions											-.117	-.401	-.168
11. Convergent Productions												-.216	-.258
12. Divergent Productions													-.087
13. Evaluative Productions													

* p < .05 ** p < .01 *** p < .001

a. The correlations for the ten dependent variables are calculated from raw scores and not as proportions of total responses.

B30242